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Spash, Clive L.

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Clive L. Spash

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Bulldozing Biodiversity:
The Economics of Optimal Extinction¹

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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 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 start by explaining the assumptions behind biodiversity and ecosystem valuation and how economic logic legitimises, rather than prevents, ongoing habitat destruction and treats species extinction as optimal. Biodiversity offsets provide a means for operationalising 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 economic textbooks 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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INTRODUCTION

Many ecologists and conservation biologists have become advocates for an economic approach to ecosystem degradation and biodiversity loss which emphasises the principle cause as 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 recognise, demonstrated and captured. That is the logic of The Economics of Ecosystems and Biodiversity (TEEB) a United Nations Environment Programme (UNEP) backed project. 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 ecosystems 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). By the time TEEB (2010) produced its synthesis report, subtitled *Mainstreaming the Economics of Nature*, there was considerable momentum behind neoliberal 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 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 higher than the income of nation states e.g., Bangladesh, Vietnam, Hungary, Ukraine (Dietz and O'Neill 2013 pp.144-145). This is the corporate world 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 based on neoclassical economic theory as developed by environmental economists. Typically those promoting the 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 institutions will be required, such as biodiversity offsets, banking and bonds; (v) 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 will help them make powerful allies in economics and finance and enable them to talk with corporations on their own terms.

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 markets has proceeded as if there were no alternatives. I refer to this as part of a new environmental pragmatism (Spash 2009, 2013). As in other environmental areas (e.g., ecological economics see Spash 2013), 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 financial crisis 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 (2014: 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”.

In this article I want to explore, for the non-economist, the assumptions behind environmental economic theory and how it conceptualises values. Some may be surprised to discover the approach does not promise to protect biodiversity and in fact is consistent with the optimal extinction of species.² This involves understanding the role of trade-offs, opportunity costs and individual preferences in economics. I then look at how economic valuation leads to market governance and as part of this biodiversity offsets. I scrutinise claims that offsets stimulate economic well-being and avoid regulatory inefficiency. I then analyse the ethical premises of the economic logic for government to support biodiversity offsets, exposing the falsity of claiming economics is a value free alternative to an ethically based conservation approach. 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.

HOW MUCH IS THAT ECOSYSTEM WORTH?

The way in which environmental economists employ microeconomic neoclassical theory is illustrated in Figure 1. The figure brings together the conceptualisation of costs and benefits

² 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 extinction is optimal even if they do include such welfare calculations. Clark, C.W., 1973. Profit maximization and extinction of animal species. *Journal of Political Economy* 81, 950-961.

of conservation as marginal units that can be reflected in functional relationships to land use. For illustrative purposes land area represents the means for supplying species habitat and ecosystem services as objects of conservation value. The use of land as a proxy occurs in practice, e.g. as a pragmatic approach to biodiversity banking in the USA (Mann et al. 2014 p.38).

FIGURE 1 ABOUT HERE

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 charge 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. In the absence of any monetary benefit being taken into account no land would be allocated to species habitat or ecosystem services, according to Figure 1, 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 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. 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. These are keeping the option open for possible future personal use, the value to future generations of use, and the value of knowing something exists (whether you or anyone else uses it or not). The categories represent an arbitrary selection, chosen because they appear plausible to the average environmental economist and conform to their model (unlike more comprehensive classifications from environmental ethics e.g., Rolston III 1985). They are regarded as part of what gives an individual utility (or happiness).

In order to make Figure 1 operational all these values, typically expressed as willingness to pay, 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 Figure 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 the 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 Figure 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, that otherwise would be absent, so improving

health and life expectancy. In this way the value of health and life would come into the cost calculations as secondary benefits i.e., reducing the cost of using land for food production as opposed to using it for conservation (assuming for illustrative purposes that they are mutually exclusive).

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 capital (e.g., human, social, cultural, spiritual and of course natural). A popular 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)

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. If ecosystem services are essential and non-substitutable then the benefit function would go off the chart as humanity dies out, assuming humans value their continued existence.

Similarly, if one person values say a species beyond all else they violate economic logic. 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). Economists typically 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 calculations.

The theoretically correct measure for a loss of biodiversity should be the minimum compensation people are willing to accept (Knetsch 1994, 2005), but environmental economists reject asking this in violation of their own theory because, even if not infinite, the numbers are deemed too large (Arrow et al. 1993). Instead they use willingness to pay because anyone paying ‘too much’ relative to their income can then be excluded as being ‘strategic’. Those appearing to have lexicographic preferences, protesting against payment or offering any unacceptable responses, are also excluded. Over time sophisticated redesign of surveys has been undertaken to help respondents understand what is expected of them and give appropriate answers minimising the need for their exclusion (Spash 2008a).

Such economists then totally miss the point of underlying ethical motives. A problem with non-utilitarian (e.g. rights based) ethical responses is that payments do not reflect the assumptions of economic (Spash et al. 2009). 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 valuation on starving people. Mainstream economists assume exactly that, equating amount paid to the value of an object, whilst not wishing to probe motives for payment.

There is an underlying liberal political aspect to all this. Individuals are assumed to know what is best for them so they should have autonomy to choose without coercion. Mainstream economists also start by assuming agents have perfect knowledge, so avoiding the issue that people may know nothing about an object of value, something that is rather

common for biodiversity (Spash and Hanley 1995). Relaxing this assumption confronts economists with the problem of knowing how much information of what type to give people. In addition, preferences are assumed to be fixed *a priori*, excluding the possibility that preferences are constructed during information provision and surveying (Spash 2002). This is despite survey design explicitly being made ‘incentive compatible’ to get self-interested responses in accord with the economic model of human behaviour.

Let us ignore all these problems, and take the analysis on faith as new environmental pragmatists do. There is an alternative interpretation of the cost-benefit exposition, in Figure 1, 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 Figure 2, this means in an unexploited environment the marginal benefits have reached zero. The logic is that there are only so many bugs and beasts 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.

FIGURE 2 ABOUT HERE

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 cuddly, powerful strong and beautiful. Research shows zoological collections already reflect public preferences for what is attractive in 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. 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 Figure 2.

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 Figure 3 by the marginal cost function shifting to the left over time, i.e. over provision of conservation is continuously increasing.

FIGURE 3 ABOUT HERE

Once conservationists have entered into this discourse and accepted the logic of economic valuation the only come back they have is in trying to argue ecosystem services and species 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 economists world. Adopting the mainstream economic approach means conservation biology becomes a matter of getting people to hold the ‘right’ preferences. This is a position shared by others.

“The present biodiversity crisis results from an ill-advised path of development, created by human preferences that are highly damaging to the environment. Conservationists should aim not only for quick changes in the set of current preferences, but also for a progressive revision of values and a change in lifestyles that could be a significant help to biodiversity conservation.” (Maris and B  chet 2010 p.970)

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. Hopefully there are still plenty of conservationist out there that find this idea unappealing enough to make pursuing institutional alternatives a political reality.

PUBLIC POLICY AND GOVERNANCE BY MARKETS

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 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/Liberal 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." 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 a 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 defensive expenditures. Regarding defensive expenditure as positive economic activity is a basic error,

even though economists do now commonly make this mistake, (e.g. Stern et al. 2006). 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'.

The argument might be made that bulldozing biodiversity, emitting pollution and creating environmental destruction creates something more valuable. In fact, so much more valuable that the destruction can be repaired and society can come out ahead. Even if this is accepted, offsetting is then actually an intermediate cost of production and again should not be counted as a final product, something of value. So there is a fundamental contradiction in claims that offsetting is going to create a whole new business growth sector and that the market approach is low cost and more efficient than direct regulation.

In ten Kate, Bishop, and Bayon (2004) the argument is made that legal regulation is inflexible and leads to stupid 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.

The caricature of markets as always best avoids the real issue of whether regulation needs to 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 which is who has the presumption of the law on their side. Coase famously and erroneously argued 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 impose a presumption in favour of development. The developer has the right to proceed as long as they compensate. 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.

OFFSETS, ECONOMICS AND ETHICS

Conservation today is being told 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”. New environmental pragmatists are particularly concerned that conservation has already failed, is underfunded and needs to do something ‘new’. They see the need for large sums of money, while developers and financiers are promising large sums. The arguments borrowed from economics are then used to support claims that offsets will promote fair exchange of old biodiversity for new and that this is in the public interest because the trade will make society better-off. That also means government intervention should be undertaken to support such offset markets.

An interesting aspect of this argument is how it is presented as a value free logical case. Indeed a core aspect of the argument is that this replaces the old ethical conflict in conservation, between intrinsic and instrumental values, with a new practical approach. As Juniper (2012) states with respect to the more general issue of pricing Nature:

“By appreciating that nature is vital for economics, and has measurable tangible financial values, it is possible to get the attention of people who have at best hitherto regarded nature a supplier of resources, or worse still an economically costly distraction that gets in the way of economic 'growth'. Making the moral case in the face of such beliefs won't work. If, on the other hand, such scepticism can be met with economically compelling logic, then we might get a bit further.”

This presents a choice between some weak “moral case” and an “economically compelling logic”. Not only is this a false dichotomy but the argument obscures the ethical premises which lie beneath economics and pretends they do not exist.

The economic position on offsets can be analysed for its ethical premises.³ The basic argument in favour of ‘decision makers’ adopting biodiversity offsets as official policy can

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.

be broken down into six steps. In doing so I refer to paying compensation because whether developers engage in direct offsetting or buy credits makes no difference from an economic (as opposed to other) perspective; the cost of the compensation is what counts.

1. There is an amount of compensation that falls between that which (underfunded) conservationists or (poor) landowners are willing to accept as a minimum amount of money and (wealthy, over capitalised) developers, corporations and financiers 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 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.

In this argument, preference satisfaction is taken to be 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 individuals 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 people's preferences are satisfied is taken as the criteria of welfare and this is measured, as in any market exchange, by willingness to pay of the buyer and, the simultaneous and reciprocal, willingness to accept payment of the seller.

The exchange being proposed raises a series of objections. (i) There may be complexity and indeterminacy so that uncertainties arise preventing both parties from ever being well-informed. (ii) Information can be asymmetrical so one party has an advantage over the other (unequal power). (iii) Premise A may be rejected as a moral criteria because people are quite simply not always the best judge of what should be done, and enter into exchanges against their own best interests. (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 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. (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. Acting as selfish individuals seeking to negotiate personal gain would destroy the trust that is necessary for social institutions (including markets) to operate (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).

Mainstream economics also assumes away issues of income inequity 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 inequity 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 p.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).

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. 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 clear inequity in both wealth and power with corporate interests, developers and their political allies having the upper hand on both fronts.

Efficiency itself 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.

Claims about offsets as economically efficient instruments providing pricing incentives for conservation 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.

DESIGNING HUMAN-NATURE RELATIONSHIPS

There are numerous issues that arise when designing any regulatory system. Table 1 summarises some of the principle issues arising over biodiversity offset design. These are regarded as technical issues to be solved by those who are in favour of offsets. However, they also implicitly concern a range of deeper concerns such as human-Nature 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.

TABLE 1 ABOUT HERE

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 attributes of lost Nature.

In ten Kate, Bishop, and Bayon (2004 p.) 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 2014).

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). The current director and 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 denial of alternatives (Doak et al. 2014).

Prioritising market trading over social and ecological criteria divorces financial instruments from the underlying reality. In the case of species banking a site is given credits for providing 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 additionality 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/Liberal 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 (£111000 in 2010 and 2011) to the Conservative Party. He is 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.

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 profit corporate interests. If nothing else Nature protection cannot be allowed to stand in the way of business and economic growth.

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 development and deconstructing regulatory blocks to corporate interests. 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.

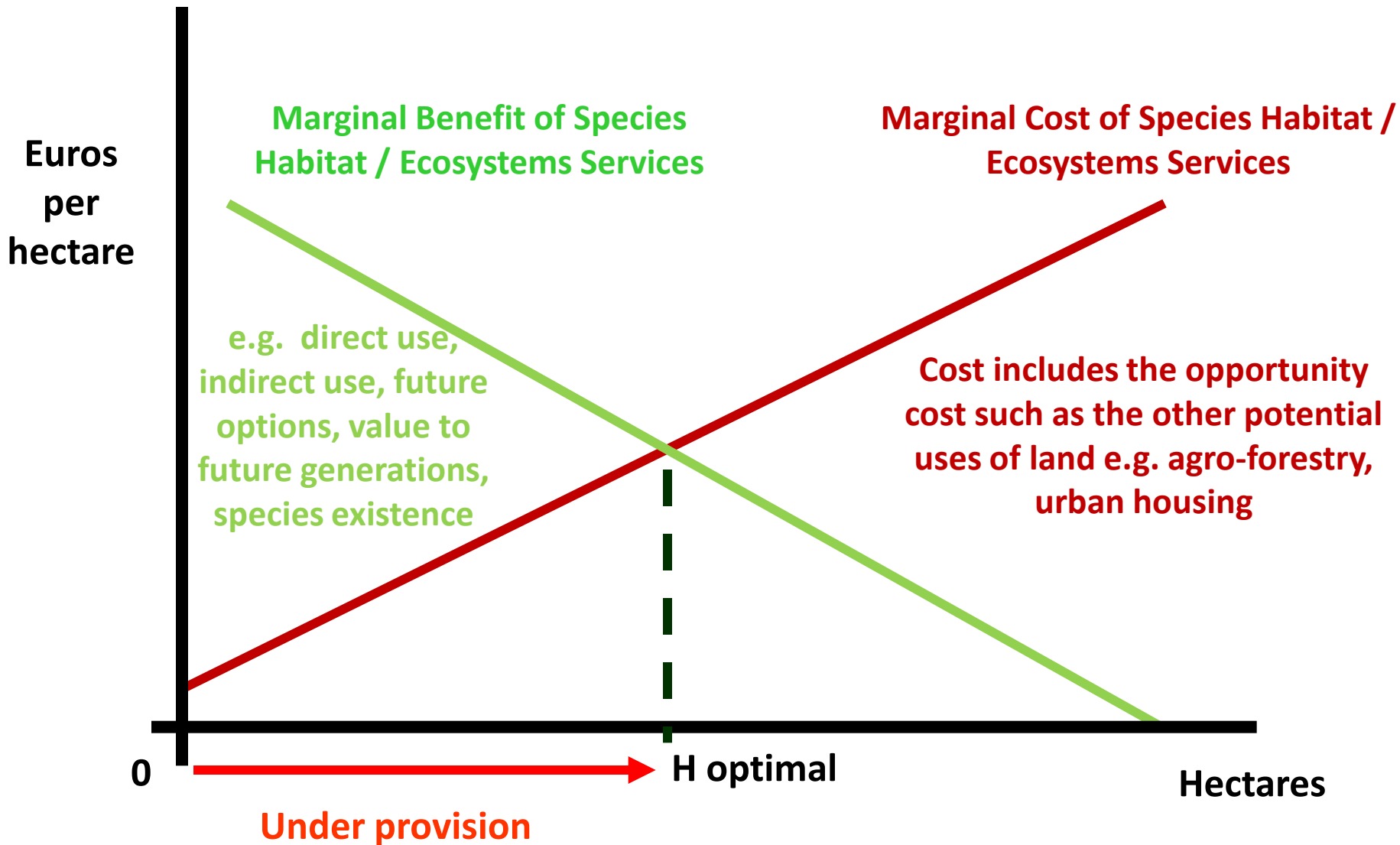
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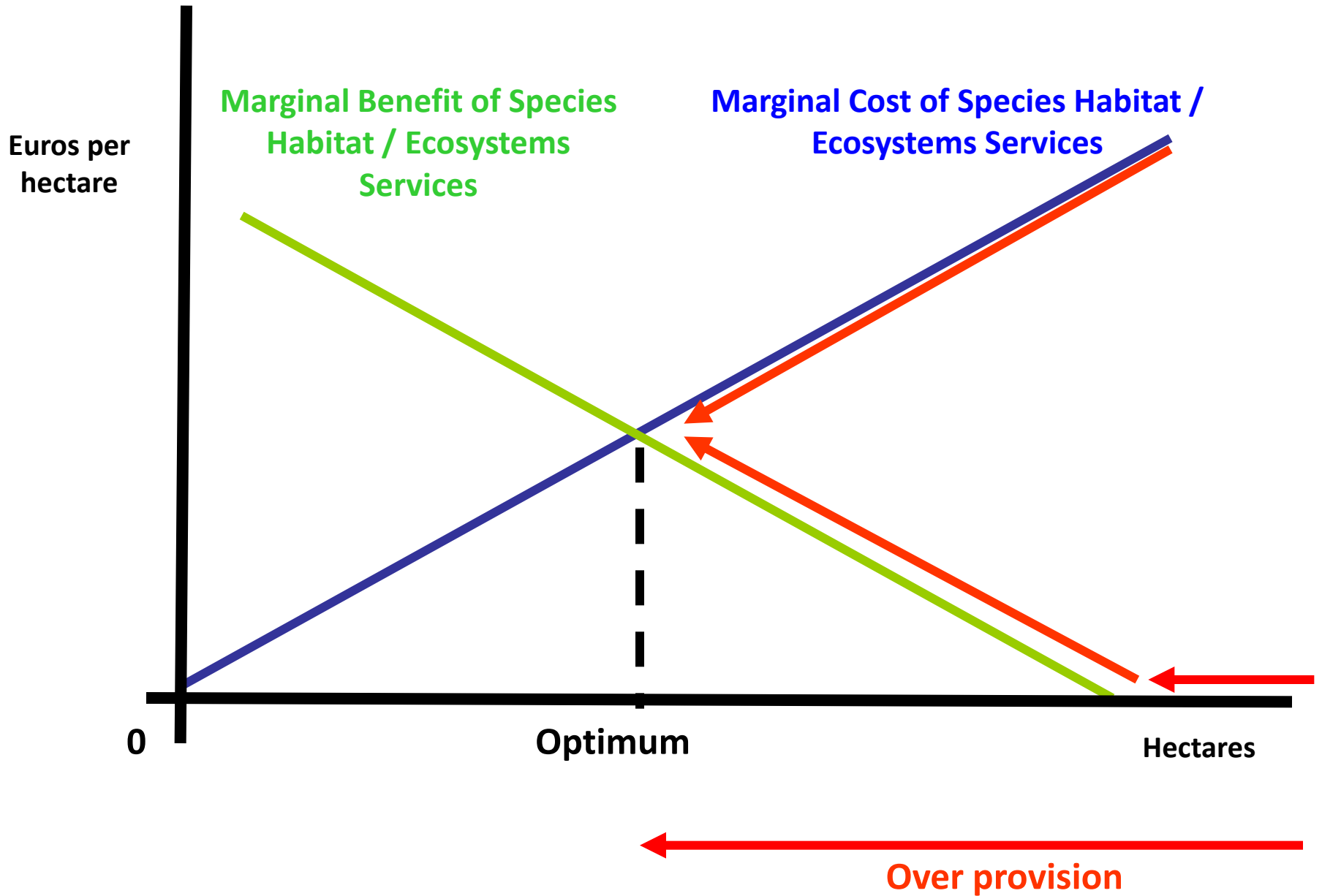
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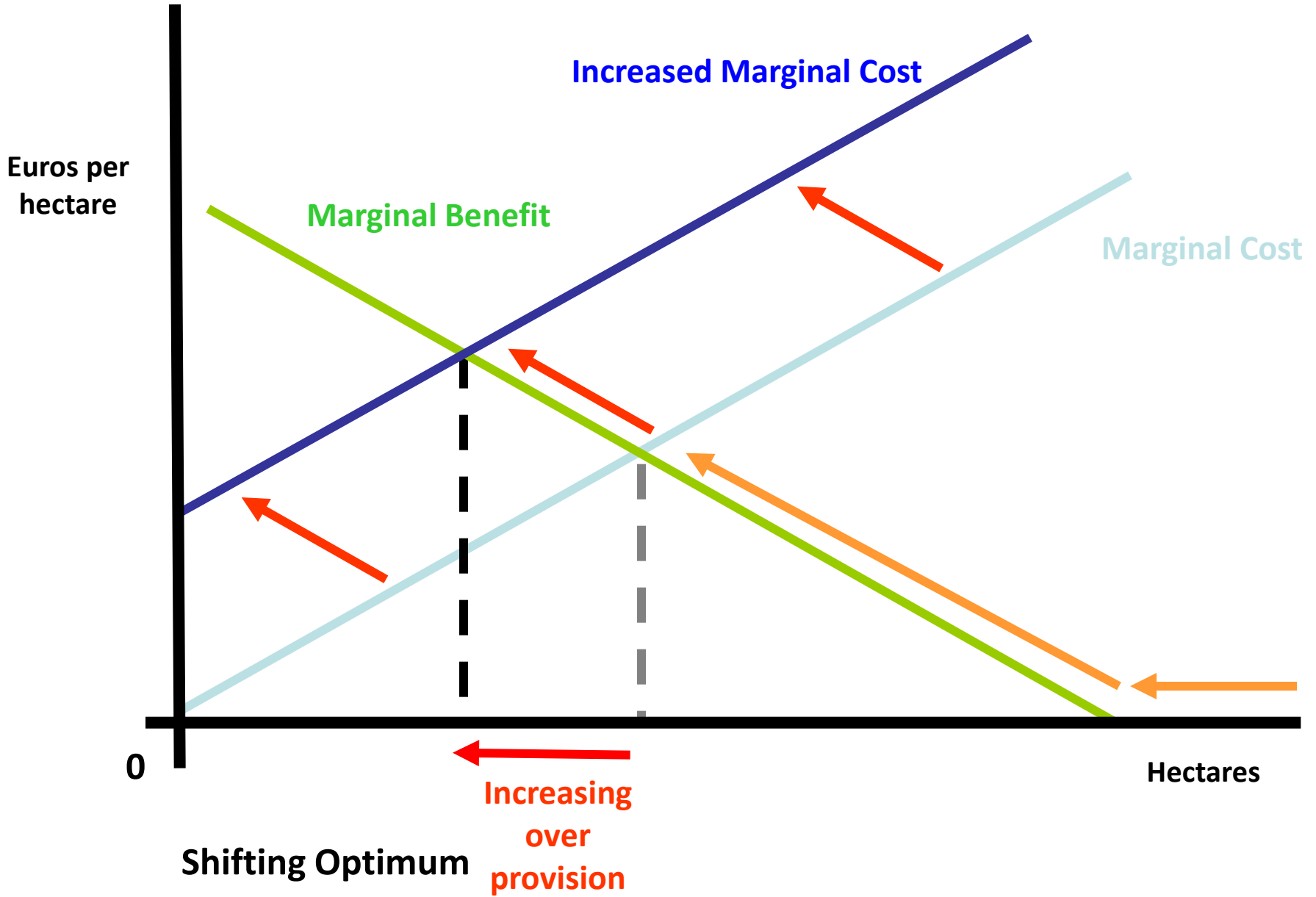


Table 1: Some Issues with Offsets ‘Design’ and Operation

Baseline scenario, what is the current state of biodiversity?

Additionality, what does the offset site add that would not have occurred anyway?

Comparability, how far is the offset site equivalent with the original site and on what basis?

Measurability, how are characteristics of importance to be measured (i.e. metrics) and what about things that cannot be quantified or measured?

Commensurability, can all the objects of value be measured on the same basis?

Complexity, how much ecosystem complexity is permissible before offsets become infeasible?

Time, over what time period will the offset scheme deliver and be maintained?

Space, where should the offset site be located relative to the original site?

Uncertainty, what approach is taken to the unknowns and the unknowables?

Measure of last resort, is the mitigation hierarchy going to be strictly employed so that offsets only occur after harm has been avoided, mitigated and/or rehabilitated?

Enforcement, what mechanisms are going to ensure monitoring and performance?

Transactions costs, who will cover all the set-up and running costs involved, and are they less than alternatives e.g. direct regulation?

Liability and severance, 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?

Speculation, will trading of credits result in financial speculation and price manipulation for rent seeking and profiteering.

Financialisation, will there be a divorce between traded credit value and the physical reality to which credits relate?

Multilevel Governance and Development
Wirtschaftsuniversität Wien
Institutsvorstand : ao.Univ.Prof. Dr. Gunther Maier
Welthandelsplatz 1
A-1020 Wien, Austria
Tel.: +43-1-31336/4777 Fax: +43-1-31336/705 E-Mail: mgd@wu.ac.at
<http://www.wu.ac.at/mgd>