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Clive L. Spash^{*†} and Frédéric Hache^{*‡}

Abstract

In a short apologia, Joseph Bull claims that offsets in general, and biodiversity offsets in particular, are unfairly criticised by unscientific moralists and are, on the contrary, unquestioningly essential and unavoidable to 'some' unspecified extent. His claim rests on three main arguments: offsetting is a necessity under existing international agreements, it is essential for closing the so-called finance gap, and it is already being undertaken when quantifying conservation losses and gains and so unavoidable. In this short discussion paper, each of these arguments is critically reviewed and shown to be flawed. A range of underlying issues are raised concerning Bull's implicit value theory, ethics of compensation and appeal to mainstream orthodox economics. The neutral objective scientific stance he portrays is also brought into question.

Keywords: biodiversity, offsets, financialisation, commodification, finance gap, cost-shifting, global biodiversity framework, market-based solutions.

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Introduction

Joseph Bull, from the Biology Department at Oxford University, posted a paper seeking to justify the necessity of biodiversity offsets within the context of Nature finance (Bull 2026). He claims that offsets are unfairly vilified and are on the contrary indispensable, if limited to some unspecified extent, for halting and reversing global biodiversity loss. He regards critics as cynical moralists (Bull 2026: 2) who take subjective positions irrespective of debate, which he believes justifies his ignoring a range of critical arguments against offsets including ethical concerns and commodification (Bull 2026: 6). His apologia for offsetting presents three main arguments: (i) offsetting is a necessity under existing international agreements; (ii) offsets allow private investors to fill a conservation public finance gap; (iii) quantifying conservation via metrics means offsetting is already implicit in conservation practice and there is no alternative. In the following sections, each of these arguments is taken in turn and shown to be flawed. In actual fact, the 'we' needing offsets is constituted of those seeking to justify ongoing environmental degradation who profit from biodiversity loss, and includes financial intermediaries and conservation consultants. As will be shown, Bull's own position is also far from the neutral objective scientific stance he portrays.

Before proceeding the meaning of 'offsets' requires some clarification because Bull appears to merge different conceptualisations and so fails to make explicit various aspects, e.g. exchange in physical metric vs monetary terms, public vs private institutional contexts, government vs market controlled exchange. Biodiversity offsets are measurable positive conservation outcomes (i.e., avoided destruction or restoration projects), which are packaged as tradable financial instruments (i.e. offset credits). The purpose is to allow developers to claim that their deliberate destruction of biodiversity can continue because a compensatory action has been bought and paid for. Exchange here involves a monetary price for buying the private property right to destroy biodiversity. Such market exchange involves the imposition of equivalence despite obvious non-equivalence because biodiversity gain and loss occur at different times and places, and sometimes involve different species and habitats.

Three Arguments for Offsetting

Major International Agreements Necessitate Offsetting

Bull supports this claim by citing the Global Biodiversity Framework (GBF) published as Decision 15/4 (UNEP 2022), because it calls on both preventing negative impacts and implementing nature conservation/restoration. This is assumed to entail a “net outcomes framework”, although the clause on 'no net loss', that appeared in the draft GBF (UNEP

2020), was rejected and actually excluded from the final agreement (UNEP 2022). Similarly, the term 'nature positive economy' was excluded, despite having been heavily lobbied for by a coalition of corporations and large NGOs. Despite this, Bull asserts that:

“[...] mitigation of biodiversity impacts is widely conceptualized as being achieved through a so-called ‘mitigation hierarchy’ of various preventative and compensatory actions necessarily including offsets.” (Bull 2026: 3)

He goes on to claim that offsets are “crucial to the GBF 2030 mission” and “[...] this is not simply my own interpretation; the GBF states the need for "Stimulating innovative schemes such as ... biodiversity offsets" Target 19(d)” (Bull 2026: 4). Bull then criticises those opposing offsets for glossing over or having missed this crucial role given to offsets in the GBF.

In fact, offsets are mentioned under Target 19d along with several other instruments, which Bull ignores. Target 19d, when stated in full, is as follows:

“Stimulating innovative schemes such as payment for ecosystem services, green bonds, biodiversity offsets and credits, and benefit-sharing mechanisms, with environmental and social safeguards;” (UNEP 2022)

So, to be clear, Target 19 is one out of twenty three Targets and Subclause d) is one of seven, and offsetting is one of five mechanisms mentioned in this Subclause. Yet, Bull (2026: 4) asserts “no biodiversity offsets, no achievement of the GBF”. The passing mention of offsets hardly merits this conclusion. Indeed, that the financially well backed pro-offsetting lobbyists achieved such a minimal endorsement, subject to the qualification “with environmental and social safeguards”, merely indicates the option was kept open, along with many others. Similarly, the general call of the GBF for reducing biodiversity loss and restoring degraded areas cannot be equated to requiring biodiversity offsetting.

Restoration undertaken at a project level can involve attempting to measure what is lost and gained, but that is far from being able to fully compensate and negate environmental impacts, as Bull claims. The quantitative measurement that he recommends cannot (by definition) address qualitative change. Measurement is also only an approximation to complex ecosystem structure and function, and is typically highly abstracted from it in order to create simplified metrics. The higher the aggregation the greater the abstraction from both ecological structure and social context. Restoration of unforeseen damages and historically degraded environments is also very different from biodiversity offsetting of deliberately harm. In practice, offsetting calls upon conservation actions that are intended to compensate for

intentional creation of future environmental destruction and involves a tradable financial instrument that only requires contractual legitimation not ecological equivalence.

When moving beyond the project level to the kind of generic offsetting being envisaged by financial markets, the abstraction moves to the highest level possible. Standardising and simplifying millions of species into a few standard types to create units of account (i.e., the biodiversity offsets and credits mentioned by the GBF) is a necessary condition for market liquidity. This process involves divorcing objectives from ecological and social context in a process that equates with creating a form of commodity. An essential aspect is achieving the broadest equivalence possible to establish the largest scale of trading of one thing for another. In the extreme the result is to claim universal commensuration under the guise that money can equate everything and therefore compensation for anything can be achieved via paying money. Substitution is assumed to be perfect and everything has a price. This simply enables developers and resource extractors to continue business as usual by buying the right to destroy habitats and degrade natural environments at will.

In international treaty negotiations, offsets have provided political leverage to prevent tighter environmental regulations. This is empirically well-established and part of their political appeal, as every lobbyist knows. For example, the aviation industry adopted a voluntary carbon offset policy—*Carbon Offsetting and Reduction Scheme for International Aviation* (CORSIA)¹—which has been employed to help prevent regulation of aviation emissions, specifically international flights arriving at or departing from the European Economic Area, under the EU cap and trade scheme (O’Leary, et al. 2025). The International Civil Aviation Organisation (ICAO) has then been able to maintain its forecast of tripling its emissions by 2050 compared to 2015 (cited by European Commission 2026). Similarly, during negotiations for a Global Plastic Treaty several countries and companies involved in supply chains for products (e.g. plastic resin) derived from fossil fuels have promoted plastic offsets to prevent a cap on plastic production (Staufenberg 2025).

The Finance Gap

Bull presents what has become a widespread financial advocacy argument across a range of policy areas, which is the need for finance. He claims this is "[a]nother major concern of GBF", while in fact finance is the topic of Target 19, and so the same concern he already discussed. The advocacy of the finance gap originates within the banking and finance sector (Standing 2024), and has been framed to define a key policy role for themselves. It characterises nation States as being too poor to address biodiversity loss and claims that only

¹ <https://www.icao.int/CORSIA> (Accessed 17/05/2026)

private investors can supply the necessary money. Bull then presents offsetting as being an irreplaceable mechanism to cover this finance gap and claims that there is no clear replacement mechanism that is not simply offsetting by another name.

This is a bold claim which appears divorced from what actual biodiversity offsets have been able to raise in financial revenues. According to Bull himself this was US\$11.7bn in 2022. Those promoting the finance gap calculate it as being US\$700bn annually (Deutz, et al. 2020). So, even if we take its advocates arguments for granted, offsets fail to supply a major source for addressing the finance gap.

That nation States are unable to find public finance to address biodiversity loss is also easily contested. For example, environmentally harmful subsidies were calculate in 2024 as between US\$1,700bn (UNEP 2024) and US\$2,600bn (Bromley 2024), and more recently at \$2,400bn (UNEP 2026). If such calculations are correct then shifting a fraction of harmful subsidies would close the entire finance gap without any need for private capital, raising taxes or increasing budget deficits. Governments might, for example, rearrange public finance to address agricultural impacts on biodiversity by incentivising different agricultural and land-use practices without even reducing subsidies or changing the beneficiaries.

Bull's attempts at explaining how offsets would remove financial incentives to carry out harmful activities, appear convoluted and offsets an unnecessary diversion. He remarks that:

“[...] a huge part of the rationale for offsetting is that the requirement to offset under the mitigation hierarchy ([...]) should incentivize the avoidance of negative impacts in the first place.” (Bull 2026 4-5)

In fact, the difficulties and expense of the mitigation hierarchy can be avoided by developers ability to jump directly to the last step of the hierarchy, namely offsetting. There also appears little or no connection between offsets and curbing environmentally harmful subsidies for the production and consumption of fossil fuels, fertilizers and pesticides, or the infrastructure incentivising resource extractivism. This evidences a failure of Bull's arguments to address what actually incentivises biodiversity destruction and so what would be effective in countering that loss at source.

In this context, Bull appeals to the economic concept of 'environmental externalities' without reference to, or understanding of, this being a contested specific orthodox mainstream theory. That theory assumes environmental destruction is an unintended consequences of poor price signals in a perfectly functioning idealised price-making market economy. A more realist approach is to identify environmental destruction as a deliberate form of cost-shifting on to others by business enterprises with the objective of increasing their private financial gains

(Spash 2021). Mainstream orthodox economics has proven lacking in its analysis and understanding (Spash 2024).

If proposals are made to internalise externalities and employ financial incentives in modern markets then the structure of those markets needs to be understood. That requires (social) scientific analysis of how actual markets operate, prices are set, fluctuate and are influenced, for example by power relationships, regulatory capture, vested interests and advocacy. Private profit seeking and wealth accumulating priorities of financiers, bankers and businesses diverge diametrically from protecting ecosystem structure and functioning or biodiversity. Offsetting is part of a general trend, towards treating nature in financial and economic terms (e.g. credit, capital, service) that misconceptualises the object of study and misdirects conservation and environmental protection into seeking investment returns and taking risks to achieve the highest returns (Spash and Hache 2021).

Quantifying Biodiversity Loss Means Offsetting

Bull argues that there is no alternative to quantifying biodiversity loss and compensating for those losses which he believes can be undertaken to meet the required standards.

“To be robust, these standards must involve at some point quantifying losses, and overcoming those, such that **any gains are commensurate with losses**, and an overall gain is assured. If they do so, then this effectively must involve offsets to some degree.”

(Bull 2026: 5-6 emphasis added)

Here Bull confuses quantifying losses and gains with offsetting and assumes it implies commensuration. Environmental impacts can be quantified without any implied or actual offsetting. For example, projects restoring habitat in one location and time are never equivalent to habitat in another location and time, but this is what offsetting involves. He goes on to claim offsetting can achieve total certainty about biodiversity loss and gain via perfect quantification which contradicts his own qualifications over the imperfections of restoration and its ongoing potential for improvement.

Even more fundamentally the type of offsets being institutionalised, and under public debate, are those connected to financial markets and market trading. Market liquidity requires simplifying to an extreme extent using metrics focused on fungibility and aggregation. They involve creating a commodity form. Contra Bull's derision, commodification is a well established phenomenon in economic analysis of how capitalist market institutions operate and seek to establish trade-offs between loss and gain in any exchange. Their theoretical basis goes back over 150 years in economic thought (Marx 1867), has raised a variety of serious theoretical debates (Polanyi 1957; Sen 1985; Sraffa 1962), led to attempts to create

commodity form for environmental valuation (Krutilla and Fisher 1978; Schulze, et al. 1981) with numerous problems (Spash 2000; 2002; 2008a; Vatn 2000) and leading to a range of broader critical questions and concerns (Gómez-Baggethun and Ruiz-Perez 2011; Kosoy and Corbera 2010; Lohmann 2011; Spash 2008b; Taylor-Dawson 2021). However, Bull simply refuses to discuss the topic, and regards it as an example of moral objection to offsetting that he then dismisses as being 'subjective'. Clearly, here he is implicitly claiming his own public policy intervention on biodiversity is a value free objective scientific position. Such a stance equates to adopting a simplistic form of objectivist philosophy of science in the mode of classic empiricism derived from mechanistic physics and engineering.²

Bull's failure to take morality and ethics seriously is also a fundamental failure. Public policy and its advocacy involves value positions that are part of the decision over which actions are deemed good or bad. Bull himself is implicitly adopting a consequentialist moral philosophy and instrumentalising non-humans and ecosystems. Apparently he is unaware of his own moral position and the ethical theories which he is advocating. At points he actually advances an extreme version of commensuration, for example when he states that:

“Nature offsets’ – e.g. offsets for greenhouse gas emissions, or biodiversity loss – are activities intended to **fully and completely compensate** for negative environmental impacts.” (Bull 2026: 2 emphasis added)

Negative environmental impacts can involve human mortality and morbidity as well as loss of non-human life, habitats, ecosystem structure and function. Under Bull's offsetting approach value is purely instrumental and reduced down to the functional attributes of a given entity. For example, if the only value of concern is the functional ability to sequester carbon then a tree sequestering carbon in a National Park in Costa Rica is the same as a tree doing so in a London street. Social, temporal and spatial context are quickly lost in such approaches. Whether this is to be accepted cannot simply be dismissed out of hand. The debate over offsetting cannot be divorced from the value basis on which it is justified nor the moral implications of those values. Neither can it be treated as simply a physical technical engineering issue of metric management divorced from social and political context.

Bull's apparent derision and dismissal of arguments he regards as 'subjective' and moral are conducted as if he were purely arguing some unquestionable objective scientific position

² Objectivity when used in this classical way suggests that facts speak for themselves and empirical observation can easily reveal truth. Sayer (2010) refers to this as “naive objectivism” because establishing knowledge claims is now generally recognised to require much more than this. The stance was historically adopted by empiricists and prevalent amongst natural scientists from the late 17th century onwards.

from a disconnected neutral standpoint. His intervention on this public policy issue implies it can be resolved without bringing any value positions forward. Bull's personal website states that he is an ecologist and conservation scientist, but his earlier training in physics and engineering appear to inform his (implicit) over simplified objectivist philosophy of science.³ An important point of reflection is the basis on which arguments are both rationalised and omitted. Bull's rhetoric implies anyone opposing offsetting is unscientific and has preloaded value positions, but his own position is hardly value free or neutral. In this regard, it is worth noting that he is director and co-founder of a consultancy "Wild Business", established in 2012, which sells services relating to offsetting, ecosystem services, natural capital and environmental cost-benefit analysis.⁴ In these debates the personal, social and institutional context from which arguments arise is important for assessing their judgemental rationalism.⁵

Discussion and Conclusions

Overall, the arguments presented by Bull fail to substantiate his conclusion that:

“there is simply no achievement of our worldwide goal to ‘halt and reverse biodiversity loss’ without at least some, robust, biodiversity offsetting; just as there is no pathway towards net zero of greenhouse gas emissions without at least some carbon offsetting.”

(Bull 2026: 7)

Actually, offsetting is being used to justify biodiversity loss rather than seeking to halt it. Net zero is similarly aimed at justifying increases in the scale of global Greenhouse Gas emissions, not reduce them, on the basis that they can be offset and capital accumulating economic growth can be maintained. Offsetting is a diversion from the environmental policies necessary to halt harmful activities. It has seen decades of failure, which can hardly be dismissed as due to purely technical issues that will be rectified by better metrics and engineered design. Inherent in the construction of offsetting schemes is the search for financially cheap projects and gross abstraction and over simplification of ecosystem structure and function in order to create a false equivalence of environmental destruction with reconstruction, where the two are typically divorced from each other in time and space. Policy focus should instead be placed on addressing the well-known root causes of biodiversity loss and climate change.

³ <http://joewbull.com/> (Accessed 16/05/2026)

⁴ <http://www.wildbusiness.org/about-2/> (Accessed 16/05/2026)

⁵ Feminist philosophy of science has criticised the ideal of a dis-embedded and dis-embodied researcher because everyone has a social/cultural/personal context. Standpoint theorist then argue that a knowledge claim's objectivity requires critical reflection involving multiple, especially marginalised, perspectives. The SEECentre discussion paper by Schoppek and Dengler (2026) critically reflects upon these ideas and the role of judgment in making knowledge claims.

Public policy can achieve this through a combination of direct regulation and changing the structural mechanisms that incentivise environmental degradation for profit. The causes of biodiversity loss are widely recognised as land use change, resource extractivism, human population increase, human consumption scale and qualities, human spread of invasive species, insecticide and pesticide use, and the consequences of pollution in general (including climate change). Overarching these multiple causes and reinforcing them is the general drive for economic growth as development, including invasive technology, land grabbing, displacement of people and traditional practices, and the associated warfare involved in securing ever more supply lines of ever decreasing resources.

Public policy then needs to be directed at such structural causal mechanisms. For example, a recent study, from the EAT-The Lancet Commission (Rockström, et al. 2025), identified a primary driver of biodiversity loss as deforestation due to raising and feeding cattle. Rather than recommend offsetting this loss and continuing business as usual, they identified the scale and qualities of human consumption as causal mechanisms to be addressed. Their conclusions for public policy were to cut food waste and change diets away from intensive meat consumption with the added benefits of reducing Greenhouse Gas emissions and water pollution from pesticides. Regulation here means banning advertising for unhealthy food and changing relative prices via taxes and subsidies to favour healthier diets.

Bull recognises that reducing and halting biodiversity loss requires addressing its causal mechanism but offers no substantive analysis or evidence of why offsetting would address those causes. In fact, his argument is essentially based on claiming that *ex post* corrective measures for biodiversity loss should be defined as offsetting. However, the conceptual basis for that designation is sorely lacking. Indeed Bull fails to justify his various underlying positions including: his value theory based on consequentialism, instrumentalism, and commensuration; his ethics of compensation for deliberate harm and treatment of non-humans; his economics of externality theory, perfect substitution and trade-offs. Bull presents offsetting as a purely technical, naively objective, natural science issue that can be settled without any reference to social structures, economic institutions or ethics. As such he fails to relate to the actual context in which biodiversity loss is occurring and what is necessary to stop the ongoing mass extinction of species and pollution creating potentially catastrophic climate change. Offsetting, as understood by its main advocates—neoliberal politicians, bankers, financiers, business elites and major corporations—is simply a mechanism for continuing business as usual, which means justifying the exponential growth of environmental destruction.

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