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# Nature positive must incorporate, not undermine, the mitigation hierarchy

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For the concept of nature positive to succeed as the lodestar for international action on biodiversity conservation, it must build upon lessons learned from the application of the mitigation hierarchy – or risk becoming mere greenwash.

## Main Text:

Nature positive is a hot topic in conservation[1]. Described as the biodiversity version of a 'net zero' climate goal, the desired outcome is an improvement in the state of nature, not merely mitigation of impacts. Coined in 2020[2], amid negotiations over the new Global Biodiversity Framework under the Convention on Biological Diversity, the concept is being rapidly embraced by industry, governments, financiers and the conservation sector[1-4]. More than 90 world leaders have signed on to the Leaders' Pledge for Nature, which calls for a nature positive future to be achieved by 2030, and 11 of the global Fortune 100 companies already have aspirations to contribute to nature positive[3].

Although the recently agreed Kunming-Montreal Global Biodiversity Framework did not adopt the term explicitly, its mission and headline goals reflect the nature positive ambition. The 2030

mission envisions the current biodiversity crisis being halted and reversed, putting nature on a path to recovery through repairing damage, recovering species, restoring ecosystems, and ensuring connectivity across landscapes to allow for adaptation[5]. This optimism and the shared, positive, vision that this represents is to be celebrated. However, as the focus turns to defining what counts as nature positive, and organisations of all kinds seek to make claims about their contribution towards it, the race is on to prevent it from becoming greenwash[6].

Economic activities often harm biodiversity. For more than two decades, the 'mitigation hierarchy' has been a guiding principle for addressing such harms[7,8]. This standard framework is widely embedded in the environmental impact assessment policies of governments and financiers around the world[8]. For a development project to comply with international best practice in applying the mitigation hierarchy, it must achieve at least a 'no net loss' (ideally net gain) of biodiversity[9,10]. This requires first avoiding potential impacts, minimising unavoidable impacts and restoring biodiversity damaged by the project, before any remaining impacts are offset. Those offsets must typically benefit the same biodiversity features as those impacted – that is, they must be 'like-for-like'. This is important, especially when the requirement for an offset is because the impacted species or ecosystem are already threatened. Actions that benefit different species or ecosystems to those impacted cannot mitigate the harm caused by the development.

The 'nature positive' concept takes matters further still. Nature positive means more nature in the future than we have now. That means that even the impacts we have already had on nature need to begin to be reversed - we certainly cannot afford to accumulate more losses overall. Because of that, nature positive relies on a foundation of strong compliance with the mitigation hierarchy. Meeting that requirement, and then expanding beyond it towards nature positive, is a challenge for all sectors, operations, activities and projects. Whereas the mitigation hierarchy has typically been applied at the level of individual development projects (for example, a new mine) to manage their biodiversity impacts, nature positive explicitly broadens ambitious net gain requirements to entire value chains and financial portfolios[2]. This imposes obligations on, for example, companies, that extend beyond the footprint of their individual projects, and beyond biodiversity to encompass other components of nature, including water, land and climate[11].

Unfortunately, the scale and pace of commitments necessary to manage even direct and attributable impacts on nature have not yet been adequate. Failure to achieve the less-ambitious goal of the mitigation hierarchy – no net loss of biodiversity – is common and widespread: project-level no net loss is often not achieved, evidence of avoidance is scarce, and biodiversity offsets are beset with design, implementation and integrity problems[12,13,14,15]. With an estimated USD$60 trillion of new infrastructure in the pipeline[16], much of which will damage biodiversity, the need for best-practice implementation of the mitigation hierarchy has never been greater. However, it risk being overlooked in the rush towards the more alluring 'nature positive', unless firm guardrails are set.

If nature positive is translated into action with rigour, the wide global appeal of the concept presents an opportunity to trigger smarter avoidance and more effective mitigation of impacts, as well as incentivize long term, fair and equitable outcomes for nature and people from ecological restoration and rewilding investments. However, if it replaces established, rigorous approaches such as the mitigation hierarchy, it risks amounting to mere greenwash. Embedding the

mitigation hierarchy as an essential, but not sufficient, condition, is the first step in the nature positive journey.

*Risk of greenwashing*

Already, we are seeing instances where the embrace of nature positive is providing a platform for eroding the mitigation hierarchy. Without rigorous application of the mitigation hierarchy including clear exchange rules, policies that seek to achieve a net gain across a range of natural capital assets could lead to inappropriate substitution, with losses of one asset being considered a 'net environmental gain' if compensated by gains in others.

For example, the government of Australia recently released its long-awaited response to a scathing review (https://epbcactreview.environment.gov.au/resources/final-report) of its national biodiversity conservation laws which govern how it manages significant impacts on threatened species and ecosystems. The response was titled "Nature Positive Plan"[17], and while much in the document was welcomed by conservation groups, a worrying feature was a foreshadowed shift from a current policy requirement of best-practice implementation of the mitigation hierarchy, towards financial payments to a centrally-managed fund in cases where offsets are unable to be found, and relaxation of like-for-like compensation requirements. This would allow the accumulation of losses of already highly threatened biodiversity, for which offsets are difficult or impossible, on the premise that a more general, 'nature positive' outcome might be 'better overall'. The approach also risks undermining the incentive for avoidance that is central to the mitigation hierarchy, in order to 'streamline' development approvals[18]. Nature positive should not be used as cover for accumulation of further losses for already-threatened biodiversity features.

A second example demonstrates that even conservation NGOs are engaging with nature positive in a way that threatens to undermine the necessary focus on rigorous application of the mitigation hierarchy to all negative biodiversity impacts. WWF-UK described their recent landmark report aimed at charting the pathway to Net Zero for agriculture as "A Nature-Positive Pathway to decarbonise UK agriculture and land use"[19]. However, their use of the term "nature positive" related only to using nature to reduce and sequester carbon emissions, and in support of policies that have benefits both for climate and biodiversity (such as diet shifts away from meat). This loose use of the term by the environmental sector to mean simply "doing things that are good for nature" may make it harder to convince government and business that recovering nature requires strong and rapid action to halt impacts – not only to invest in positive actions.

The emerging prospect of 'biodiversity credits' being used to contribute to nature positive introduces further risk. Such schemes are so new that methodologies and definitions are still emerging, but essentially, voluntary biodiversity credits are tradeable units that represent positive biodiversity outcomes[19]. These are described as being distinct from offsets as they are not intended to be used to compensate directly for biodiversity damage, even though reference to 'net' outcomes implies some form of compensatory role [20,21]. Companies are encouraged to purchase biodiversity credits as part of their "nature-positive journey"[22]. However, there are so far no common standards around both generation and purchase of credits, nor for associated claims companies could make related to nature positive. This means that companies can purchase voluntary biodiversity credits and make a claim relating to nature positive, but consumers,

shareholders and investors can't assess its veracity – nor know whether the mitigation hierarchy has been applied. Claiming to be aligned with nature positive on the strength of purchased credits without fully addressing a company's negative impacts is misleading at best.

*Ensuring nature positive is positive for nature*

We argue that building on a foundation of full implementation of the mitigation hierarchy is essential for actions that benefit nature to be considered as genuine contributions to nature positive. An extended form of the mitigation hierarchy – the mitigation and conservation hierarchy - exemplifies such an approach, in which project-level impact mitigation can be achieved, while extending its principles across value chains[11]. From extensive experience with the mitigation hierarchy over the past 25 years, we recommend the following core elements to ensure that nature positive genuinely supports the recovery of nature.

Nature positive accounting must distinguish among three elements: 1) applying the mitigation hierarchy to direct and attributable impacts (including indirect and cumulative impacts); 2) addressing more-diffuse impacts through the value chain; and 3) achieving further conservation benefits unrelated to compensation (Figure 1). First, all new impacts materially attributable to an organisation's immediate sphere of influence must be subject to best-practice implementation of the mitigation hierarchy (Fig. 1a, panel i). This means that all their impacts on biodiversity must first be avoided, minimized and temporary damage addressed through restoration. Only after these steps are fully exhausted should any remaining impacts be compensated for based on like-for-like replacement, defined by science-based exchange rules that are well established in both policy and practice[9,10]. Compensation and offsets are simply not credible solutions in many circumstances, making it essential to establish limits to their use – especially for species at risk of extinction, and ecosystems at risk of collapse[22]. In these situations, avoidance or prevention of impacts is the only acceptable mitigation option. Accumulation of uncompensated impacts on threatened biodiversity due to out-of-kind or otherwise inadequate offsets (Fig 1b, panel i) is not compatible with nature positive.

Second, nature positive requires engagement with the challenge of estimating the type and amount of biodiversity impacts through the entire value chain[11,23]. Any impacts throughout the value chain over which a company has leverage must be mitigated[11] (Fig. 1a, panel ii). Impacts should be minimised, and unavoidable losses should be fully compensated. Like-for -like compensation can be more challenging to achieve for value-chain impacts, as most companies have imperfect visibility of their value chain impacts. This makes emphasis on identifying leverage points for avoidance of impacts all the more important – such as through sustainable sourcing of ingredients[23]. Investment in compensatory actions that are as closely linked to the biodiversity affected by residual impacts through value chains remains key (Figure 1a, panel ii), instead of merely purchasing generic biodiversity credits that fail to benefit affected biodiversity (Fig 1b, panel ii).

Third, once the mitigation hierarchy has been fully applied to both project-level and value chain-level impacts, additional investment in conservation actions that benefit biodiversity can help fulfil the final step towards alignment with nature positive. Ideally, this investment in conservation that goes beyond compensation for damage will benefit a wide range of biodiversity, including high-value and difficult-to-restore ecosystems (Fig 1a, panel iii) rather than only relatively easy and cheap to restore biodiversity components (Fig 1b, panel iii). This non-compensatory element is where there is greatest potential for well-designed 'biodiversity

credits' to play a part in achieving a global nature positive goal. However, only when the minimum requirements to apply the mitigation hierarchy to project- and value chain-level impacts are satisfied could claims that an organisation is aligned with the global goal of nature positive be considered credible.

*No shortcuts to nature positive*

Conservation is inherently difficult: a wicked problem. Because of this, conservation approaches tend to accumulate criticism over time, which can result in them being rejected in favour of a new, fresh-sounding idea - which often contains substantial elements of the old approach, under a new name[24]. Unfortunately, this cycle can result in a failure to learn the lessons from implementation. It is not uncommon to hear practitioners or policy-makers talk as if nature positive is a new approach to conservation that will solve the now well-known challenges inherent in achieving no net loss of biodiversity. Unfortunately, there is no easy solution to conservation's wicked problems. Careful and rigorous application of the mitigation hierarchy is as key to achieving nature positive outcomes, as it is to delivering no net loss. There are no shortcuts.

**Figure 1: Only high-integrity accounting will genuinely support the nature positive goal.** **a,** Achieving true nature positive relies on strong avoidance of impacts at the project- and value chain-levels, and like-for-like compensatory actions for any residual impacts, plus further non-compensatory beneficial actions. At all three of these levels, investment in all priority biodiversity must be incentivised, not just those elements of biodiversity for which gains are easy to generate. **b**, Less-rigorous approaches to nature positive risk misleading claims and greenwash that undermine achievement of its goal. In this scenario, impacts are only slightly reduced, and impacts on difficult-to-retore biodiversity accumulate despite false claims of nature positive. Y-axis indicates the relative amount of biodiversity lost and gained; dark shading indicates biodiversity elements that are challenging to restore, pale shading indicates easily-restorable biodiversity. Dashed lines indicate impact that would occur without the nature positive agenda.

## References and Notes


1. J. W. Bull, E. J. Milner-Gulland, P. F. E. Addison, W. N. S. Arlidge, J. Baker, T. M. Brooks, M. J. Burgass, A. Hinsley, M. Maron, J. G. Robinson, N. Sekhran, S. P. Sinclair, S. N. Stuart, S. Zu Ermgassen and J. E. M. Watson, Net positive outcomes for nature. *Nature Ecology & Evolution* 4(1), 4-7 (2020).
2. Locke, H., Rockström, J., Bakker, P., Bapna, M., Gough, M., Hilty, J., Lambertini, M., Morris, J., Polman, P., Rodriguez, C.M. and Samper, C., 2020. "A nature-positive world: The global goal for nature". Available at: https://library.wcs.org/doi/ctl/view/mid/33065/pubid/DMX3974900000.aspx
3. S. O. S. E. zu Ermgassen , M. Howard, L. Bennun, P. F. E. Addison, J. W. Bull, R. Loveridge, E. Pollard and M. Starkey, Are corporate biodiversity commitments consistent with delivering 'nature-positive' outcomes? A review of 'nature-positive' definitions, company progress and challenges." *Journal of Cleaner Production* 379, e134798 (2022).
4. D.O. Obura, DeClerck, F., Verburg, P.H., Gupta, J., Abrams, J.F., Bai, X., Bunn, S., Ebi, K.L., Gifford, L., Gordon, C. and Jacobson, L. "Achieving a nature-and people-positive future." *One Earth*, 6(2), pp.105-117. (2023)

5. Convention on Biological Diversity, “The Kunming-Montreal Global Biodiversity Framework”. https://www.cbd.int/doc/c/e6d3/cd1d/daf663719a03902a9b116c34/cop-15-l-25-en.pdf (2023)
6. E. J. Milner-Gulland, Don’t dilute the term Nature Positive. *Nature Ecology & Evolution*, 6(9), 1243-1244 (2022).
7. Brownlie, S., Treweek, J. “The Mitigation Hierarchy and beyond: guiding appropriate biodiversity trade-offs in assessments for sustainability.” In Sustainability Assessment. (Routledge) pp. 239-259. (2016)
8. Barbé, Hélène, and Nathalie Frascaria-Lacoste. "Integrating Ecology into Land Planning and Development: Between Disillusionment and Hope, Questioning the Relevance and Implementation of the Mitigation Hierarchy." *Sustainability* 13, no. 22 (2021): 12726.
9. Business and Biodiversity Offsets Programme, “Working for Biodiversity Net Gain: An Overview of the Business and Biodiversity Offsets Programme (BBOP) 2004–2018.” Washington, D.C. https://www.forest-trends.org/bbop_pubs/overview2018 (2018)
10. IUCN, “Biodiversity Offsets Policy”. IUCN, Gland, Switzerland. https://www.iucn.org/resources/file/iucn-policy-biodiversity-offsets (2016)
11. E.J. Milner-Gulland, P. Addison, W.N. Arlidge, J. Baker, H. Booth, T. Brooks, J.W. Bull, M.J. Burgass, J. Ekstrom, S.O. zu Ermgassen, and L.V. Fleming, Four steps for the Earth: mainstreaming the post-2020 global biodiversity framework. *One Earth*, 4(1), pp.75-87. (2021)
12. S. O. S. E. zu Ermgassen, J. Baker, R. A. Griffiths, N. Strange, M. J. Struebig and J. W. Bull, The ecological outcomes of biodiversity offsets under “No Net Loss” policies: A global review. *Conservation Letters* 12(6), e12664 (2019)
13. J. W. Bull, L. J. Sonter, A. Gordon, M. Maron, D. Narain, A. E. Reside, L. E. Sánchez, N. Shumway, A. von Hase, F. Quétier, Quantifying the “avoided” biodiversity impacts associated with economic development. *Frontiers in Ecology and the Environment* 20(6), 370-378 (2022).
14. M. Maron, C. D. Ives, H. Kujala, J. W. Bull, F. J. F. Maseyk, S. Bekessy, A. Gordon, J. E. M. Watson, P. E. Lentini, P. Gibbons, H. P. Possingham, R. J. Hobbs, D. A. Keith, B. A. Wintle and M. C. Evans Taming a wicked problem: resolving controversies in biodiversity offsetting. *Bioscience* 66(6), 489-498 (2016).
15. Jacob, C., Pioch, S. and Thorin, S., 2016. The effectiveness of the mitigation hierarchy in environmental impact studies on marine ecosystems: A case study in France. *Environmental Impact Assessment* Review, 60, pp.83-98
16. S.O.S.E. zu Ermgassen, P. Utamiputri, L. Bennun, S. Edwards, J.W. Bull The role of “no net loss” policies in conserving biodiversity threatened by the global infrastructure boom. *One Earth*, 1(3), pp.305-315. (2019)
17. DCCEEW, “Nature Positive Plan: better for the environment, better for business” Department of Climate Change, Energy, the Environment and Water, Canberra, Australia (2022) https://www.dcceew.gov.au/sites/default/files/documents/nature-positive-plan.pdf
18. A. Bond, Pope, J., Morrison-Saunders, A., Retief, F., Gunn, J.A.E. Impact assessment: Eroding benefits through streamlining? *Environmental Impact Assessment Review* 45, 46–53. (2014) https://doi.org/10.1016/j.eiar.2013.12.002
19. A. Taylor, “Land of Plenty: A nature-positive pathway to decarbonise UK agriculture and land use”, WWF-UK wwf.org.uk/sites/default/files/2022-02/WWF_land_of_plenty.pdf (2022)
20. NatureFinance, Pollination. Biodiversity credit markets: The role of law, regulation and policy. Geneva, Switzerland. (2023)
21. World Economic Forum, “Biodiversity Credits: Unlocking Financial Markets for Nature-Positive Outcomes.” https://www3.weforum.org/docs/WEF_Biodiversity_Credit_Market_2022.pdf (2022)
22. J.D.. Pilgrim , S. Brownlie, J. M. M. Ekstrom, T. A. Gardner, A. von Hase, K. ten Kate, C. E. Savy, R. T. T. Stephens, H. J. Temple, J. Treweek, G. T. Ussher, & G. Ward.. A process for assessing offsetability of biodiversity impacts. *Conservation Letters*. DOI:10.1111/conl.12002 (2013)
23. J.W. Bull, I. Taylor, E. Biggs, H.M. Grub, T. Yearley, H. Waters, and E.J. Milner-Gulland, E.J., Analysis: the biodiversity footprint of the University of Oxford. *Nature*, 604(7906), pp.420-424. (2022)
24. K.H. Redford, C. Padoch, C. and T Sunderland, Fads, funding, and forgetting in three decades of conservation. *Conservation Biology*, 27(3), pp.437-438. (2013)

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