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Advocacy Policy Brief

Target Recipient:

This brief is intended for the attention of Rt Hon George Eustice MP, Secretary of State for Environment, Food and Rural Affairs, as the sponsor of Bill 220 2019-21 ('Environment Bill'), currently at Report Stage in the House of Commons and therefore open for amendments before the Third Reading.

Small Tortoiseshell Butterfly – One of many near-extinct species in the UK

Environment Bill 2020 – Strengthening Biodiversity Protection in the UK post Brexit through a Multi-criteria Target-based Ecological Compensation

Given the alarming decline of biological diversity in the UK, new provisions for the halt and reversal of biodiversity loss are proposed under the 2020 Environment Bill as part of new legislation to strengthen UK environmental protection measures post-Brexit. The bill seeks to implement biodiversity offsetting in the planning system to reconcile tensions between developmental needs and environmental protection. However, scrutiny of the proposed measures and of the planning system as their context show them to be ill-equipped to tackle biodiversity loss for two reasons. First, given its inability to account for the complexity of assessing technical and social biodiversity values, and the high default rate at achieving ecological equivalence, offsetting is deemed an inappropriate mechanism to achieve the proposed objective of 'net biodiversity gain'. Second, the positioning of the offsetting scheme as a form of contractual governance in the planning system is expected to lead to a bias towards developer interests and weakening-effect on conservation efforts. Policy responses to biodiversity loss must acknowledge trade-offs between development and biodiversity protection and address the short-comings of technical offsetting processes. The bill must therefore be amended to implement in the planning system an environmental protection statute complemented by a target-based ecological compensation scheme that creates a biodiversity commission to define regional and national conservation and restoration targets. Planning decisions should be guided by a local multi-criteria evaluation framework that involves the public into planning decisions and is informed by the commission's restoration targets to produce alternative scenarios of socio-ecological development that guide planning approval processes.

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Foundational Science

Biodiversity refers to "the variety of life, including variation among genes, species and functional traits" [1]. It can be distinguished into functional diversity, describing the richness and abundance of species to fulfil certain functions in an ecosystem, and genetic diversity, meaning the measure of genetic variety in a species to support its coevolution with the environment [2]. Both types of biodiversity play a key role in the functioning of biospheric processes in a number of ways [1]. Apart from strengthening the efficiency of ecological communities, biodiversity offers a range of functional response mechanisms that ensure Earth system resilience by regulating processes such as climate or geochemical flows [3]. Biodiversity therefore offers crucial ecosystem services in the form of provisional and cultural (non-)uses, and through the regulation and support of the functioning of ecosystems on which all human activity relies [4] (*see: Figure 1*).

Box 1: The 'Safe Operating Space' for Human Development

The 'safe operating space' for human development describes a frame in which human activity is suggested to be without significant risk of inducing critical changes in Earth system processes that negatively impact human wellbeing [2,3]. Based on extensive research, experts have delineated nine key processes to Earth system functioning, the so-called 'Planetary Boundaries', for which upper limits are defined as the maximum level of anthropogenic stress tenable by the planet. The 'safe operating space' recognises the need for continued physical development to meet the population's needs, while acknowledging the need to preserve critical Earth system functions for future development.

Driven by habitat loss and fragmentation through urbanisation, land-use, and climate change [5, 6, 7], biodiversity loss not only reduces ecosystem productivity [1], but also threatens the stability of ecosystem functions, and thus of human economic activity and development reliant on ecological processes.

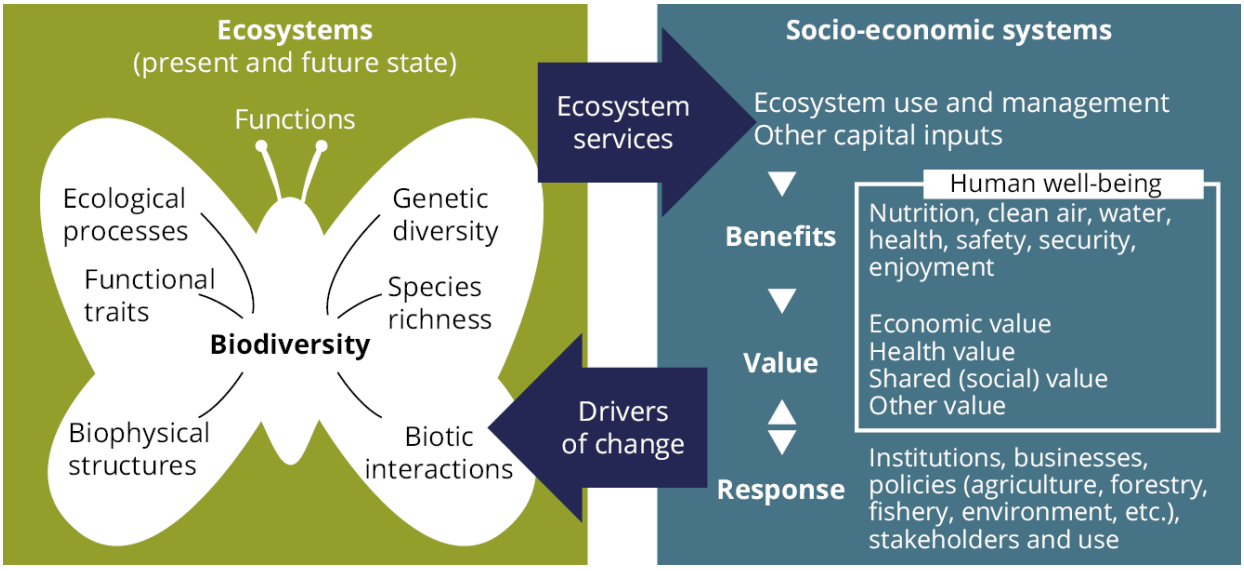

Figure 1: Ecosystem Services – The Role of Biodiversity for Human Development (*Source: EEA, from: Maes, et al., 2013*)

Given the high rate of biodiversity loss worldwide [2], it is recognised as one of two critical variables that currently endanger human well-being by threatening to surpass levels of environmental change deemed within a 'safe operating space' for human development [3] (*see: Box 1*).

Biodiversity loss in the UK specifically continues at an alarming rate. Since 1970, 43% of overall species have declined in abundance and 15% of species are now threatened [8] (*see also: Figure 2*). Independent assessments have further shown the UK to have failed to meet 17 out of 20 targets under the UN Convention on Biological Diversity by 2020, speaking of a "lost decade for nature" in the face of growing anthropogenic stressors on biodiversity and a lack of adequate policy responses [9]. Research shows that biodiversity loss in the UK can be attributed mainly to intensive management of agricultural land and other habitats, accelerating climate change, and development-related pressures, such as hydrological change and urbanisation [7], with the last point especially pressing in the context of a continuing growth of artificial surfaces, threatening biodiversity-rich forests and wetlands [10,11].

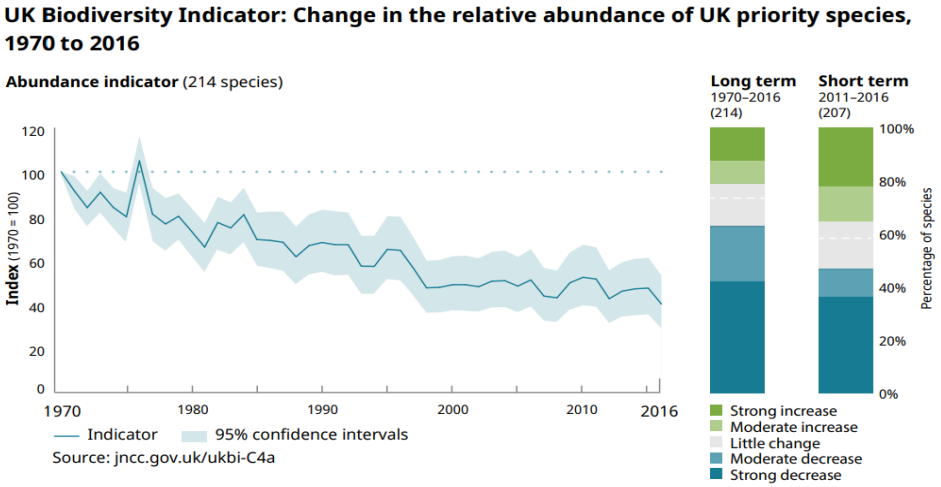

Figure 2: Change in the relative abundance of UK priority species, 1970 to 2016 (*Source: State of Nature, 2019:11*)

Existing Governance

Given the rapid rate of biodiversity decline in the UK, the government has committed to reversing loss and restoring it where possible through the introduction of a 'net gain' principle into the planning system [14,15]. The new Environment Bill 2020 currently at Report Stage in the House of Commons is now set to operationalise this objective through the introduction of a biodiversity offsetting (BDO) scheme (*see: Box 2*), mandating developers to submit a strategy for the achievement of a net gain of biodiversity through their operations in order to be granted planning permission. Biodiversity gains shall then be made in the form of onsite restorations or contributions to offsite preservation or restoration efforts [16,15]. However, despite being lauded as a 'win-win' solution for sustainable development [17,18,19], BDO schemes suffer three major short-comings.

Box 2: Biodiversity Offsetting

Biodiversity offsetting schemes aim to compensate for biodiversity loss at a development site by generating ecologically equivalent gains elsewhere [12], therefore achieving 'no net loss' if impact cannot be avoided or reduced through application of the mitigation hierarchy [6]. Offering to reconcile the tension between development and environmental protection, offsetting schemes grow in popularity around the globe [12,13].

First, extensive research has questioned the efficiency and ecological viability of offsets. Assessments of ecosystem functionality and composition between original and offset sites indicate frequent failure to achieve ecological equivalence [6,12,20], due to the complexity of accurately defining and measuring offset targets, the uncertainty of gains, and restoration time lags ranging from 100 – 1000 years [12]. Portraying BDO as a simple ecological transfer therefore ignores the technical incommensurability of ecosystems [20]. Second, framing BDO as a techno-ecological process disregards the socio-political nature of the issue [18]. The redistribution of ecosystem services arising from offsets encompasses potential distributional conflicts. Further, individual's distinct ways of relating to the natural environment posits offsetting as a socio-ecological value conflict. Biodiversity is therefore also socially incommensurable [20].

Third, the introduction of BDO schemes has been shown to lead to regulatory losses, as it may undermine non-offset preservation measures and out-crowd voluntary offsets [21].

The new Environment Bill is ill-equipped to address these short-comings for two main reasons.

First, the new BDO scheme will likely fail to account for the above discussed complexity of ecological restoration, as the fragmentation of the planning system leads to a lack of national-scale congruence of restoration efforts [15,18]. Further, while the metric on which the new BDO scheme will rely to evaluate biodiversity value and determine offset ratios is marketed as an 'easy-to-use tool' [17], its simplicity is deemed inappropriate to encompass the complexity of defining offset targets [18].

Second, the proposed scheme is designed as a form of contractual governance, which means that offsets are negotiated between developers and local planning authorities (LPAs) [18]. A pilot of the proposed BDO scheme elicited that LPAs faced manifold challenges in engaging with the scheme (*see: Box 3*). LPAs bargaining position towards developers were weakened by the narrative of BDO achieving both, development and environmental protection, as the 'political imperative' of sustainable development and the alignment of development interests between both parties led to a de-prioritisation of environmental targets [18,22,23]. Moreover, the relegation of decision-making into a confidential space of negotiation excludes public participation in offset planning. Given the distributional and value conflicts inherent in offset design decision, the proposal therefore also fails to address the social incommensurability of biodiversity [18].

Box 3: DEFRA's Biodiversity Offsetting Pilot 2012-14

DEFRA piloted a BDO scheme with 6 LPAs between 2012-14 to test the feasibility of national-scale implementation. Assessments of the pilot elicited multiple issues, such as a lack of guidance for implementation, confusion on the prioritisation of development versus environmental protection targets, and a lack of local institutional capacities to adequately engage with the scheme [22,23]. Given the fact that no planning decisions were actually agreed upon under the pilot, the project was perceived as a failure [18].

Governance Recommendations

Building on the above analysis of the short-comings of BDO schemes, and of the proposed scheme in particular, it becomes apparent that the Environment Bill will fail to effectively address the rampant decline of biodiversity in the UK. Policy responses to halt biodiversity loss and govern ecological restoration must competently engage with two core challenges: first, the tension between socio-economic development and environmental protection, and second, the technical and social incommensurability of biodiversity. Three changes to the Environment Bill are necessary to achieve this, and to turn the Environment Bill into a truly meaningful contribution to biodiversity protection and sustainable development post-Brexit.

1) Acknowledging the staggering and continuing decline of biodiversity in the UK, and the magnitude of the risks associated with biodiversity loss, the new bill must integrate an environmental protection statute in the planning system that defines environmental preservation and biodiversity conservation as a central aim of planning. Such a provision, adequately referenced and highlighted in guidance material to LPAs, could effectively strengthen the mitigation hierarchy and support LPAs in prioritising preservation over developer interests [18].

2) The current provision of the bill to make biodiversity gain a condition for planning permission [24] is likely to fail given the high rate of offset failure, the complexity of assessing social and ecological biodiversity values, and the contextual constraints of the planning system. The new bill should therefore replace the proposed BDO scheme with a target-based ecological compensation scheme [25]. This will include the creation of a biodiversity planning commission under Natural England, which defines regional and national restoration targets [18]. Local and regional development plans will then be required to concur with conservation strategy in obligating developers to conserve, offset, or restore biodiversity values as needed to achieve local targets. Such a mechanism will not only ensure an active contribution of the planning system to biodiversity protection and restoration as compared to the passive nature of offsetting, but also operationalise the aforementioned environmental protection statute.

The commission will further act as a third party in LPA-developer negotiations to ensure prioritisation of environmental interests and alignment of local restoration or offsetting proposals with broader conservation strategy.

3) Taking into account the contested nature of biodiversity values and the uncertainties of offset success [20,12], the new bill should introduce a multi-criteria framework for evaluating BDO proposals in order to open negotiations for the public as a fourth party [20,26,27]. Based on regional biodiversity targets defined as part of the above introduced ecological compensation scheme, LPAs would collaborate in hosting stakeholder engagement processes to design and amend regional development plans on a recurring basis, outlining development projects and their contribution to biodiversity conservation and restoration. Opening space for the public to influence the formulation of criteria at the initial planning stage would then result in a number of alternative scenarios for socio-ecological development, the specifics of which can be negotiated between planning authorities and developers to ensure practicality. The multi-criteria approach offers the benefit of providing both, inclusive and meaningful involvement of public perspectives crucial to compensate for the technical and social incommensurability of biodiversity by complementing top-down assessments with bottom-up perspectives, as well as usability and efficiency of the framework to serve as a practical tool in planning and implementing development projects.

List of Cited References:

[1] Cardinale, B.J., Duffy, E., Gonzalez, A., Hooper, D.U., Perrings, C., Venail, P. et al. (2012) Biodiversity Loss and its Impact on Humanity. *Nature,* 486(7401):59-67, https://doi.org/10.1038/nature11148.

[2] Steffen, W., Richardson, K., Rockström, J., Cornell, S.E., Fetzer, I., Bennett, E.M., et al. (2009) Planetary Boundaries: Guiding Human Development on a Changing Planet. *Science,* 347(6223): 1259855-1 – 1259855-10, https://doi.org/ 10.1126/science.1259855.

[3] Rockström, J., Steffen, W., Noone, K., Persson, A., III Chapin, F.S. Lambin, E. (2009) Planetary Boundaries: Exploring the Safe Operating Space for Humanity. *Ecology and Society*, 14(2): Art. 32, http://www.jstor.org/stable/26268316.

[4] Millennium Assessment (2003) *Ecosystems and Human Well-Being: A Framework for Assessment*. Washington, D.C.: Island Press.

[5] Curran, M., Hellweg, S. & Beck, J. (2014) Is there any Empirical Support for Biodiversity Offset Policy?. *Ecological Applications,* 24(4):617-632, https://doi.org/10.1890/13-0243.1.

[6] Quetiér, F. & Lavorel, S. (2011) Assessing Ecological Equivalence in Biodiversity Offset Schemes: Key Issues and Solutions. *Biological Conservation,* 144(1):2991-2999, http://dx.doi.org/10.1016/j.biocon.2011.09.002.

[7] Burns, F., Eaton, M.A., Barlow, K.E., Beckmann, B.C., Brereton, T., Brooks, D.R., et al. (2016) Agricultural Management and Climatic Change Are the Major Drivers of Biodiversity Change in the UK. *PLoS ONE,* 11(3): e0151595, https://doi.org/10.1371/journal.pone.0151595.

[8] Hayhow, D.B., Eaton, M.A., Stanbury, A.J., Burns, F., Kirby, W.B., Bailey, N., et al. (2019) *The State of Nature 2019*. The State of Nature partnership. [online] Available from: https://nbn.org.uk/wp-content/uploads/2019/09/State-of-Nature-2019-UK-full-report.pdf (Accessed: May 2021).

[9] RSPB. (2020) A Lost Decade for Nature. [online] Available from: http://ww2.rspb.org.uk/Images/A%20LOST%20DECADE%20FOR%20NATURE_tcm9-481563.pdf. (Accessed: May 2021)

[10] Rowland, C.S., Marston, C.G., Morton, R.D., and O'Neil, A.W. (2020) *Land Cover Change 1990-2015 (25m raster, GB)*. NERC Environmental Information Data Centre. [online] Available from; https://doi.org/10.5285/07b6e5e9-b766-48e5-a28c-5b3e35abecc0 (Accessed: May 2021).

[11] Fitch, C. (2015) *UK Land Becoming More Urban*. Geographical. [online] Available from: http://geographical.co.uk/places/mapping/item/1165-uk-land-becoming-more-urban (Accessed: May 2021).

[12] Maron, M., Hobbs, R.J., Moilanen, A., Matthews, J.W., Christie, K., Gardner, T.A., et al. (2012) Faustian bargains? Restoration Realities in the Context of Biodiversity Offset Policies. *Biological Conservation*, 155(1):141-148, http://dx.doi.org/10.1016/j.biocon.2012.06.003.

[13] Apostolopoulou, E. (2016) Biodiversity offsetting in England: governance rescaling, socio-spatial injustices, and the neoliberalization of nature. *Web Ecology*, 16(1):67-71, https://doi.org/10.5194/we-16-67-2016.

[14] DEFRA. (2018) A Green Future: Our 25 Year Plan to Improve the Environment. Department for Environment, Food and Rural Affairs, London. [online] Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf. (Accessed: May 2021).

[15] Knight-Lenihan, S. (2020) Achieving Biodiversity Net Gain in a Neoliberal Economy: The Case of England. *Ambio*, 49(1):2052-2060, https://doi.org/10.1007/s13280-020-01337-5.

[16] DEFRA. (2019) *Environment Bill Summer Policy Statement: July 2019*. Department for Environment, Food & Rural Affairs, London. [online] Available from: https://www.gov.uk/government/publications/draft-environment-principles-and-governance-bill-2018/environment-bill-summer-policy-statement-july-2019. (Accessed: May 2021).

[17] DEFRA. (2013) *Biodiversity Offsetting in England. Green Paper*. Department for Environment, Food and Rural Affairs, London. Available from: (Accessed: May 2021).

[18] Condon, J. (2020) Biodiversity Offsetting and the English Planning System: A Regulatory Analysis. *Journal of Environmental Law*, 32(1):529-557, https://doi.org/10.1093/jel/eqaa018.

[19] Hannis, M. & Sullivan, S. (2012) *Offsetting Nature? Habitat Banking and Biodiversity Offsets in the English Land Use Planning System.* Technical Report. Weymouth, UK: Green House. [online] Available from: https://eprints.bbk.ac.uk/id/eprint/6031. (Accessed: April 2021).

[20] Moreno-Mateos, D. Maris, V., Béchet, A., & Curran, M. (2015) The true loss caused by biodiversity offsets. *Biological Conservation*, 192(1):552-559, http://dx.doi.org/10.1016/j.biocon.2015.08.016.

[21] Gordon, A., Bull, J.W., Wilcox, C. & Maron, M. (2015) Perverse Incentives Risk Undermining Biodiversity Offset Policies. *Journal of Applied Ecology*, 52(1): 532-537, https://doi.org/10.1111/1365-2664.12398.

[22] Baker, J., Sheate, W.R., Bennett, T., Payne, D., Tucker, G., White, O., et al. (2014) *Evaluation of the Biodiversity Offsetting Pilot Programme*. Final Report, Volume 1. Version No. 2.4. (Report to DEFRA, Collingwood Environmental Planning Ltd., and the Institute for European Environmental Policy) [online] Available from: http://randd.defra.gov.uk/Document.aspx?Document=12535_WC1051_Volume_1_Final_Report.pdf. (Accessed: May 2021).

[23] Lockhart, A.M. (2015) Developing an Offsetting Programme: Tensions, Dilemmas and Difficulties in Biodiversity Market-making in England. *Environmental Conservation*, 42(4):335-344, https://doi.org/10.1017/S0376892915000193

[24] The House of Commons. (2020) Environment Bill (as Amended in Public Bill Committee). Bill No. 220 58/1. Presented by: Secretary Theresa Villiers. Ordered by The House of Commons. [online] Available from: https://publications.parliament.uk/pa/bills/cbill/58-01/0220/200220.pdf. (Accessed: May 2021).

[25] Simmonds, J.S., Sonter, L.J., Watson, J.E., Bennun, L., Costa, H.M., Dutson, G., et al. (2020) Moving from Biodiversity Offsets to a Target-based Approach for Ecological Compensation. *Conservation Letters*, 13(2), https://doi.org/10.1111/conl.12695.

[26] Martinez-Alier, J., Munda, G. & O'Neill, J. (1998) Weak Comparability of Values as a Foundation for Ecological Economics. *Ecological Economics*, 26(19):277–286, https://doi.org/10.1016/S0921-8009(97)00120-1.

[27] Munda, G. (2004) Social Multi-Criteria Evaluation: Methodological Foundations and Operational Consequences. European Journal of Operational Research, 158(1):662–677, https://doi.org/10.1016/S0377-2217(03)00369-2.