

The Biodiversity Cost of Our Diets: A Recipe for Extinction?

Technical Report

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METHODOLOGY

Biodiversity impact

Biodiversity impacts of food consumption are highly location-dependent, meaning it's not enough to consider just the environmental effect of producing food — one must also account for where it's produced and how those impacts are distributed globally.

To assess this, a method adapted from [Eyres \(2025\)](#) was used, based on a spatial layer (LIFE 'restore') that estimates biodiversity benefit (in terms of reduced expected extinctions) from converting agricultural land back to natural habitat. This layer was updated with global crop and pasture data from FAO, IIASA, HYDE, and Jung (2020) to reflect current land use more accurately.

For plant-based foods, the biodiversity impact per kilogram was calculated by combining this spatial extinction data with crop yield data and summarising it at the national level using production-weighted medians.

For animal products, the process was more complex. Ruminants (like cattle and sheep) rely on both pasture and feed, while monogastrics (such as pigs and poultry) depend primarily on feed. Feed origins are often international, so provenance data from Schwarzmüller (2022) was used to track where feed is grown and its associated impact. For pasture use, national feed availability and conversion ratios were used (following Alexander, 2017) to estimate how much land is used per kilogram of ruminant product. These pasture impacts were linked to livestock density data to calculate biodiversity loss per kilogram.

Finally, to estimate the impact of UK food consumption, provenance matrices were applied to weight the biodiversity impact by country of origin. For instance, since 70% of UK beef is domestically sourced, the UK production impact carries the most weight in the final consumption calculation. Further methodological details can be found in Ball et al. (in press).

Dietary scenario

To assess the biodiversity impact of individual dietary choices in the UK, researchers combined the consumption impact data with national average dietary intake from FAO (2024). The diets shown in the accompanying figure are simplified examples meant to illustrate how dietary changes can reduce biodiversity harm.

The EAT-Lancet diet is designed to be consistent with both health and planetary boundaries, and allows the consumption of animal products, though in reduced quantities in many places (Willett, 2019). The vegetarian and plant-based diets are adapted from EatWell vegan and vegetarian guidelines and are scaled to match the calorie content of the average UK diet. However, since these diets are typically lower in calories, the estimated biodiversity impacts may be slightly overstated.

Current regulatory environment

Mandatory frameworks (international)

- **The Convention on Biological Diversity (CBD)**, to which the UK is a State Party, is the global legal framework governing biodiversity. It has three main objectives: the conservation of biological diversity; the sustainable use of the components of biological diversity; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. It is the convention under which the Kunming-Montreal Global Biodiversity Framework sits.

- The [Kunming-Montreal Global Biodiversity Framework](#) (GBF) was adopted during CBD Conference of the Parties 15 in 2022. It aims to help achieve the Sustainable Development Goals and outlines an ambitious strategy to realise the global vision of living in harmony with nature by 2050. The framework includes [four goals for 2050](#) and [23 targets for 2030](#). By adopting the GBF, all Parties – which includes the UK – agreed to set national targets for its implementation¹, while other stakeholders are encouraged to make and share their own commitments (CBD, 2022).

Mandatory frameworks (EU)

- **EU Nature Restoration Regulation:** The [Nature Restoration Regulation](#) is a key component of the [EU Biodiversity Strategy](#), which sets binding targets to restore degraded ecosystems. The Regulation aims to restore ecosystems, habitats and species across the EU's land and sea areas in order to enable the long-term and sustained recovery of biodiverse and resilient nature, contribute to achieving the EU's climate mitigation and climate adaptation objectives, and meet international commitments. The Regulation combines an overarching restoration objective for the long-term recovery of nature in the EU's land and sea areas with binding restoration targets for specific habitats and species. These measures should cover at least 20% of the EU's land and sea areas by 2030, and ultimately all ecosystems in need of restoration by 2050 (European Commission, 2024).
- **EU Deforestation Regulation (EUDR):** The EU regulation on deforestation-free production entered into force in June 2023 with the aim of combatting climate change and biodiversity loss. The regulation prohibits the use of seven commodities linked to deforestation or forest degradation, which includes cattle, cocoa, coffee, palm oil, rubber, soya and wood and derived products. Relevant products cannot be placed into the EU market or exported from the UK unless they meet the criteria in the EUDR (Food Foundation, 2024). The EUDR's implementation was delayed in late 2024 and will now be enforceable from 30 December 2025 (European Commission, 2024). The EU has recently been criticised for not including countries with high levels of deforestation, such as Brazil, on the 'high risk' register for forest commodity imports (edie, 2025).
- **Corporate Sustainability Reporting Directive (CSRD) and Corporate Sustainability Due Diligence Directive (CSDDD):** The CSRD entered into force in January 2023 and requires companies above a certain size to disclose information on what they see as the risks and opportunities arising from social and environmental issues, and on the impact of their activities on people and the environment. This includes biodiversity reporting using *European Sustainability Reporting Standard E4 Biodiversity and Ecosystems*, which has significant overlap with the TNFD. The first companies subject to the CSRD have to apply the new rules for the first time in the 2024 financial year, for reports published in 2025 (European Commission, 2025). The CSDDD entered into force in July 2024. The aim of this Directive is to foster sustainable and responsible corporate behaviour with regards to human rights and environmental impacts (including biodiversity loss) in companies' operations and across their global value chains (European Commission, 2025; Tuson, S. and Chan, T, 2024). However, on 26 February 2025, the EU Commission adopted a [package of proposals to simplify](#) the CSRD and CSDDD (the "Omnibus" package), which, at the time of writing, is still under discussion (European Commission, 2025).

¹ The UK's National Biodiversity Strategy and Action Plan (NBSAP), released in February 2025, commits the UK to achieving all 23 of the GBF targets at home (Defra, et al, 2024).

Mandatory frameworks (UK)

- **In England** the [Environment Act 2021](#) and [related regulations](#) establish legally binding biodiversity targets aimed at fulfilling its international commitments. These include reducing the extinction risk for species by 2042 (relative to 2022 levels), creating or restoring 500,000 hectares of wildlife-rich habitats by 2042, and reversing species decline so that overall abundance is rising by 2030, with a 10% increase by 2042 compared to 2030 levels. These objectives support the UK's pledge to meet the CBD's 30 by 30 target. There are also several other UK laws and acts of parliament that regulate biodiversity matters (Defra, 2025). As nature conservation policy is devolved, [Scotland](#), [Wales](#) and [Northern Ireland](#) have their own biodiversity goals and strategies. The Labour government has made [nature recovery one of the five priorities](#) for the Department for Environment, Food and Rural Affairs (Defra). It is also currently reviewing the Environmental Improvement Plan 2023 (Defra, 2025; Ares, E., 2024).
- **UK Forest Risk Commodities regulations:** The UK's imports of unsustainably produced foods and commodities are a notable driver of global deforestation with an associated impact on biodiversity. During COP28, the UK government announced due diligence regulations on forest risk commodities under the Environment Act 2021. This means imports of cattle products (excluding dairy), cocoa, palm oil and soy produced on illegally deforested lands will be prohibited. The regulation will also include derived products such as chocolate and leather (Defra, 2023). However, it's worth noting that the government's regulation only covers illegal deforestation and does not include coffee within the list of regulated commodities, unlike the EU regulation which covers all deforestation and does include coffee. However, these regulations are not yet in force as they have still not been laid before Parliament (Food Foundation, 2024).

Voluntary frameworks (international and UK)

- **Taskforce on Nature-related Financial Disclosures (TNFD)** was created as a global initiative that is science-based, driven by the market, and backed by governments. Its goal is to provide a comprehensive framework to help organisations identify, manage, and disclose their nature-related dependencies, impacts, risks, and opportunities (Food Foundation, 2024). The framework is voluntary and closely aligned with the objectives and targets of GBF. Since its launch, more than 500 organizations, including around 130 representing nearly USD 18 trillion in assets, have committed to voluntarily reporting on nature-related issues. These organizations view the framework as a strategic opportunity to enhance resilience, meet increasing investor expectations, and prepare for future regulatory changes (TNFD, 2024). Making the TNFD mandatory would be an important step in ensuring a level-playing field for businesses and comparability of nature-related data for investors; this should be a key policy ask of government by businesses and investors alike (Green Alliance, 2025; J.P. Morgan Asset Management, 2024; ShareAction, 2025).
- **The Science Based Targets Network (SBTN)** released its science-based targets for nature in May 2023. These science-based targets, a voluntary initiative, help companies comprehensively evaluate their environmental impacts and start setting goals to address them – initially focusing on freshwater and land, alongside climate through the Science Based Targets initiative (SBTi). The first set of nature-related targets also promotes biodiversity by encouraging corporate actions that support ecosystem preservation and restoration. These targets are meant to complement existing corporate sustainability efforts and align with both the SBTi and the TNFD framework (Science Based Targets Network, 2023).
- **The Food Data Transparency Partnership (FDTP)** is a partnership between UK government and

industry. It is currently in progress and aims to improve the availability, quality and comparability of data in the food supply chain to create a positive change in the food system towards the production and sale of more environmentally sustainable and healthier food and drink (Defra, 2023). The FDTP's work has predominantly been split between two main working groups: the Eco and Health Working Groups. Besides its work on assisting government with consistent, accurate and fair GHG reporting and building a process for product level comparison (and labelling), the Eco working group is also looking at impact reporting for other environmental metrics to support other positive efforts towards nature and the environment (Food Foundation, 2024; Defra, 2023).

References

Ares, E. (2024). *Biodiversity loss: The UK's international obligations*. House of Commons Library. Available at: <https://commonslibrary.parliament.uk/biodiversity-loss-uk-international-obligations/>

Convention on Biological Diversity (2022). *Kunming-Montreal Global Biodiversity Framework*. Available at: <https://www.cbd.int/intro>

Department for Environment, Food & Rural Affairs, Natural England and The Rt Hon Steve Barclay MP (2023). *Supermarket essentials will no longer be linked to illegal deforestation*. Available at: <https://www.gov.uk/government/news/supermarket-essentials-will-no-longer-be-linked-to-illegal-deforestation>

Department for Environment, Food & Rural Affairs (2023). *Food Data Transparency Partnership*. Available at: <https://www.gov.uk/government/groups/food-data-transparency-partnership>

Department for Environment, Food & Rural Affairs, Scottish Government, Welsh Government, Department of Agriculture, Environment and Rural Affairs (Northern Ireland) & Joint Nature Conservation Committee (2025). *Blueprint for Halting and Reversing Biodiversity Loss: the UK's National Biodiversity Strategy and Action Plan for 2030*. Available at: <https://www.gov.uk/government/publications/uk-national-biodiversity-strategy-and-action-plan>

Department for Environment, Food & Rural Affairs (2025). *Interim statement on the EIP rapid review*. Available at: <https://www.gov.uk/government/publications/environmental-improvement-plan-rapid-review/interim-statement-on-the-eip-rapid-review>

edie (2025). *EU deforestation regulation: EU accused of favouritism in country risk taxonomy*. Available at: <https://www.edie.net/eu-deforestation-regulation-eu-accused-of-favouritism-in-country-risk-taxonomy>

European Commission (2024). *Nature Restoration Regulation*. Directorate-General for Environment. Available at: https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-regulation_en

European Commission (2024). *Deforestation Regulation implementation*. Green Forum. Available at: https://green-forum.ec.europa.eu/deforestation-regulation-implementation_en

European Commission (2025). *Corporate sustainability reporting*. Available at: https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

FAO (2024). *FAOSTAT: Food and agriculture data*. Available at: www.fao.org/faostat/en/#data

FAO and IIASA (2024). *Global Agro Ecological Zones version 4 (GAEZ v4)*. Available at: www.fao.org/gaez

Green Alliance (2025). *The nature of our economy: implementing the Dasgupta Review*. Available at: <https://green-alliance.org.uk/wp-content/uploads/2025/03/The-nature-of-our-economy.pdf>

J.P. Morgan Asset Management (2024). *Food systems: How investing in natural capital management can support food system sustainability*. Available at: <https://am.jpmorgan.com/content/dam/jpm-am-aem/global/en/sustainable-investing/food-systems-paper.pdf>

Jung, M., Dahal, P.R., Butchart, S.H., Donald, P.F., De Lamo, X., Lesiv, M., Kapos, V., Rondinini, C., and Visconti, P., (2020). *A global map of terrestrial habitat types*. Scientific data, 7(1), p.256. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC7406504/>

Klein Goldewijk, K., Beusen, A., Doelman, J., and Stehfest, E., (2017). *Anthropogenic land use estimates for the Holocene – HYDE 3.2*. Earth Syst. Sci. Data, 9, 927–953. Available at: <https://doi.org/10.5194/essd-9-927-2017>

PBHP.UK (2023). *The Plant-Based Eatwell Guide*. Available at: <https://plantbasedhealthprofessionals.com/wp-content/uploads/2023/02/Plant-Based-Eatwell-Guide-Feb-2023.pdf>

Science Based Targets Network (2023). *The first corporate science-based targets for nature are here*. Available at: <https://sciencebasedtargetsnetwork.org/news/business/the-first-corporate-science-based-targets-for-nature-are-here/>

ShareAction (2025). *SUSTAIN: Why nature-loss is material for your financial institution*. Available at: https://cdn2.assets-servd.host/shareaction-api/production/resources/reports/SUSTAIN_Report_Finance_FINAL.pdf?dm=1730988796

Schwarzmueller, F., Kastner, T., (2022). *Agricultural trade and its impacts on cropland use and the global loss of species habitat*. Sustain Sci 17, 2363–2377. Available at: <https://doi.org/10.1007/s11625-022-01138-7>

Sustain (2018). *A new vegetarian Eatwell guide*. Available at: www.sustainweb.org/news/oct18_vegetarian_eatwell/

Taskforce on Nature-related Financial Disclosures (TNFD) (2024). *Over 500 organisations and USD 17.7 trillion AUM now committed to TNFD-aligned risk management and corporate reporting*. Available at: <https://tnfd.global/over-500-organisations-and-17-7-trillion-aum-now-committed-to-tnfd-aligned-risk-management-and-corporate-reporting/>

The Food Foundation (2024). *Power and Accountability: The evolving landscape for corporate reporting*. Available at: https://foodfoundation.org.uk/sites/default/files/2024-05/PuP_Reporting%20landscape%20briefing.pdf

Tuson, S. and Chan, T. (2024). *How the EU Corporate Sustainability Due Diligence Directive (CSDDD) can be harnessed to promote a just transition*. Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science. Available at: <https://www.lse.ac.uk/granthaminstitute/news/how-the-eu-corporate-sustainability-due-diligence-directive-csddd-can-be-harnessed-to-promote-a-just-transition/>