Ecological implications of nature offset markets in England

POLICY BRIEFING

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Executive summary

Nature offset markets in England, particularly Biodiversity Net Gain (BNG) and Nutrient Neutrality, represent an important opportunity to reconcile the opposing demands of a growing population and an already degraded natural environment.

Biodiversity Net Gain is intended to offset the loss of habitat from new housing or infrastructure developments by estimating the value of a habitat that will be lost and requiring developers to restore, create or purchase credits for habitats of equal value plus ten per cent. Habitat value is based on the type, size and condition of habitats. Replacement habitats are legally protected from development for 30 years.

In using habitat as a proxy for biodiversity, the policy is consistent with evidence that area-based interventions are an effective conservation strategy. However, the current approach to habitat valuation does not take sufficient account of the spatial context of destroyed and restored habitats, which means key determinants of how well the habitat can support diversity at the species and genetic levels, such as connectivity, are overlooked.

This lack of consideration given to spatial context could be addressed by ensuring all areas have an up-to-date Local Nature Recovery Strategy and putting greater emphasis on these in determining the value of future habitats. The habitats created or enhanced as a result of the policy should also be reviewed for whether the total area of replacement habitats is smaller, less diverse and in worse ecological condition than lost habitats, especially for habitats created within new developments (on-site habitats).

Nutrient Neutrality is intended to prevent increased nutrient pollution in already polluted water catchments by quantifying the likely increase in nutrient levels from new developments and requiring interventions to prevent an equal amount of pollution from entering that catchment. It is relatively straightforward to quantify nutrient pollution as a direct driver of biodiversity decline, although the evidence on the quantitative impacts of some mitigation interventions is limited.

Biodiversity Net Gain and Nutrient Neutrality are useful opportunities for increasing private sector investment in nature conservation and restoration, but for Biodiversity Net Gain in particular, it is necessary to review the outcomes delivered by this policy to ensure it does not lead to unintended consequences.

Introduction

Biodiversity is essential to ecosystem functioning. We rely on ecosystems for provisioning services like food and water, regulating services such as a stable climate, cultural services such as recreation, and supporting services such as nutrient cycling[1, 2]. However, there is a trade-off between the delivery of the goods that we consume (provisioning services) and regulating, cultural and supporting services[3]. Exploitation of provisioning services beyond the rate at which the ecosystem can regenerate leads to degradation in the continued provision of that service and ultimately, human-induced biodiversity loss[4], threatening the delivery of all ecosystem services.

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has identified five direct drivers of human-driven biodiversity loss[5]. These are land-use change, pollution, climate change, over-exploitation of natural resources and invasive species. In the UK, infrastructure development, including housing, is a major contributor to both land-use change and pollution.

In terms of land use change, 42% of new housing built between 2013 – 2022 was built on land that was previously 'non-developed', which includes some land use types that are important for nature such as forestry and open spaces (although a majority was agricultural land)[6].

For pollution, new housing can contribute to the problem of excessive nutrients in watercourses, although data on the proportion of water pollution that comes from housing in the UK is not yet available[7]. However, it has been reported that treated sewage has a bigger impact on water quality and the organisms that live on river beds than agricultural land use[8], and new housing developments are likely to increase the quantity of treated sewage.

1 Cardinale, BJ, Duffy, JE, Gonzalez, A, Hooper, DU, Perrings, C, Venail, P, & Naeem, S (2012) Biodiversity loss and its impact on humanity. Nature, 486(7401), 59-67. doi:10.1038/nature11148.

2 Díaz, S. M., Settele, J., Brondízio, E, Ngo, H, Guèze, M, Agard, J, & Zayas, C (2019) The global assessment report on biodiversity and ecosystem services: Summary for policy makers. See: https://ipbes.net/global-assessment (accessed 4 September 2025).

3 Dasgupta, P (2021) The economics of biodiversity: The Dasgupta review. HM Treasury. See: https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review (accessed 4 September 2025).

4 Díaz, S, Settele, J, Brondízio, E S, Ngo, H T, Agard, J, Arneth, A, & Zayas, C N (2019) Pervasive human-driven decline of life on Earth points to the need for transformative change. Science, 366(6471). doi:10.1126/science.aax3100.

5 Lan C, Tian Y, Xu J, Li JS (2015) Conceptual framework and operational model of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Biodiversity Science, 23, 681–688. doi:10.17520/biods.2015158.

6 Department for Levelling Up, Housing and Communities (n.d.) Land Use Change Statistics– new residential addresses. https://app.powerbi.com/view?r=eyJrIjoiYmEzNmY0MDQtMjBhZC00N2JiLTk0NGEtYzRlYzE2YjgwNWZiIiwidCI6ImJmMzQ2ODEwLTljN2QtNDNkZS1hODcyLTI0YTJlZjM5OTVhOCJ9 (accessed 4 September 2025).

7 House of Commons Library (2023) Nutrient neutrality and housing development. See: https://researchbriefings.files.parliament.uk/documents/CBP-9850/CBP-9850.pdf (accessed 4 September 2025).

8 Albini, D, Lester, L, Sanders, P, Hughes, J, & Jackson, M C (2023) The combined effects of treated sewage discharge and land use on rivers. Global Change Biology, 29(22), 6415-6422. doi:10.1111/gcb.16934.

The 25 Year Environment Plan introduced in 2018 asserts that we will be the first generation to improve the condition of the environment for our successors[9]. Since then, the Office for Environmental Protection's Annual Progress Reviews have consistently concluded that England is "largely off track" in meeting most of the 25 Year Environment Plan targets[10]. The population in the UK is growing, leading to a greater demand for resources such as housing that will increase the pressures on the environment. In England alone there is an estimated 340,000 new homes required each year[11]. The opposing demands of a growing population need to be reconciled with a deteriorating natural world.

Nature offset markets have been proposed as a mechanism to make development and nature conservation compatible[12], although there are two fundamental concerns about the extent to which this is feasible. The first is that while the destruction of nature through the permitted activity is certain, the success of efforts to offset that destruction is uncertain[13]. The second is that restoration activities might only offset some of the impacts from a development. Given that offset markets also only address one of several drivers of biodiversity loss within an ecosystem, eg development but not agriculture, markets alone are unlikely to be sufficient policy interventions to halt and reverse the loss of nature.

9 Department for Environment, Food & Rural Affairs and The Rt Hon Michael Gove (2019) A green future: Our 25 year plan to improve the environment. See: https://www.gov.uk/government/publications/25-year-environment-plan (accessed 4 September 2025).

10 Office for Environmental Protection (2025) This Government has the chance to get on track to meet legal environmental commitments – but the window of opportunity is closing fast warns OEP. See: https://www.theoep.org.uk/report/government-has-chance-get-track-meet-legal-environmental-commitments-window-opportunity (accessed 12 February 2025).

11 Bramley G (2019) Housing supply requirements across Great Britain for low-income households and homeless people: Main technical report. Crisis and the National Housing Federation. See: https://www.crisis.org.uk/ending-homelessness/homelessness-knowledge-hub/housing-models-and-access/housing-supply-requirements-across-great-britain-2018/ (accessed 4 September 2025).

12 Coralie, C, Guillaume, O, & Claude, N (2015) Tracking the origins and development of biodiversity offsetting in academic research and its implications for conservation: a review. Biological Conservation, 192, 492-503. doi: 10.1016/j.biocon.2015.08.036.

13 Zu Ermgassen, S O, Devenish, K, Simmons, B A, Gordon, A, Jones, J P, Maron, M, ... & Bull, J W (2023) Evaluating the impact of biodiversity offsetting on native vegetation. Global Change Biology, 29(15), 4397-4411. doi:10.1111/gcb.16801.

Nature offset markets in operation in England and the UK

Biodiversity offsets are measurable conservation outcomes whereby losses in biodiversity are compensated for with equivalent or additional biodiversity gains elsewhere[14, 15, 16]. Several nature offsetting schemes are emerging in England and the UK. These include compliance-based schemes, which are mandated by law, such as Biodiversity Net Gain (BNG) and Nutrient Neutrality in operation in England, as well as voluntary markets such as the Woodland Carbon Code (WCC) and Peatland Carbon Code (PCC), which are UK-wide. This review will focus on the two compliance-based markets, BNG and Nutrient Neutrality.

While each nature offset market is primarily targeting one driver of biodiversity loss, each scheme is likely to help mitigate some of the other drivers (Table 1). For example, the primary objective of the Peatland Carbon Code is to prevent carbon dioxide emissions which cause climate change. However, 80% of peatland land area in the UK has been drained or damaged by agriculture, peat extraction, and forestry[17, 18]. Therefore, actions that are consistent with the Peatland Carbon Code (such as rewetting) are likely to counter the impact of the previous land-use change by restoring a habitat that supports greater biodiversity[19, 20]. Finally, peatland restoration can deliver important water-related services such as mitigating the impacts of flooding and improving water quality[21, 22].

14 Koh, N S, Hahn, T, & Boonstra, W J (2019) How much of a market is involved in a biodiversity offset? A typology of biodiversity offset policies. Journal of environmental management, 232, 679-691. doi:10.1016/j.jenvman.2018.11.080.

15 Bull, J W, Hardy, M J, Moilanen, A, & Gordon, A (2015) Categories of flexibility in biodiversity offsetting, and their implications for conservation. Biological Conservation, 192, 522-532. doi:10.1016/j.biocon.2015.08.003.

16 Business and Biodiversity Offsets Programme (BBOP) (2009) Business, biodiversity offsets and BBOP: An Overview. Washington, DC. See https://www.forest-trends.org/wp-content/uploads/imported/overview-phase-1-pdf.pdf (accessed 4 September 2025).

17 IUCN UK Peatland Programme (n.d.) Peatland damage. IUCN. See: https://www.iucn-uk-peatlandprogramme.org/about-peatlands/peatland-damage (accessed 24 April 2024).

18 Trenbirth, H, & Dutton, A (2019) UK natural capital: Peatlands. Office for National Statistics. See: https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/uknaturalcapitalforpeatlands/naturalcapitalaccounts (accessed 4 September 2025).

19 Joosten, H (2016) Peatlands across the globe. In A. Bonn, T. Allott, M. Evans, H. Joosten, & R. Stoneman (Eds.), Peatland restoration and ecosystem services: Science, policy and practice (pp. 19–43). Cambridge University Press.

20 Bain, C G, Bonn, A, Stoneman, R, Chapman, S, Coupar, A, Evans, M, ... & Worrall, F (2011) IUCN UK Commission of Inquiry on Peatlands. IUCN UK Peatland Programme. See https://pearl.plymouth.ac.uk/gees-research/830 (accessed 4 September 2025).

21 Marttila, H, Karjalainen, S M, Kuoppala, M, Nieminen, M L, Ronkanen, A K, Kløve, B, & Hellsten, S (2018) Elevated nutrient concentrations in headwaters affected by drained peatland. Science of the Total Environment, 643, 1304-1313. doi:10.1016/j.scitotenv.2018.06.314.

22 Nieminen, M, Sallantaus, T, Ukonmaanaho, L, Nieminen, T M, & Sarkkola, S (2017) Nitrogen and phosphorus concentrations in discharge from drained peatland forests are increasing. Science of the Total Environment, 609, 974-981. doi:10.1016/j.scitotenv.2017.07.210.

TABLE 1

Matrix indicating to what extent each of the nature offsetting schemes is aimed at addressing drivers of biodiversity loss

KEY

Primary objective | Likely consequence | Not targeted

	Market			
Driver	Biodiversity Net Gain	Nutrient Neutrality	Woodland Carbon Code	Peatland Carbon Code
Land-use change – agriculture and development taking land away from biodiversity.				
Pollution – chemicals, such as those from agriculture and microplastics, impacting organisms directly and potentially destroying habitats.				
Climate change – changing abiotic conditions, impacting organisms directly via biological or behavioural processes (such as changing distributions or migratory patterns) and potentially destroying habitats.				
Over-exploitation of natural resources – extraction of plants and animals for food and material production.				
Invasives – non-native species occurring where they did not historically and outcompeting local species for resources, expansion of non-native ranges may be assisted by changing climate or land-use change.				

1.1 Principles for designing nature offset markets and the mitigation hierarchy

Organisations such as the Business and Biodiversity Offsets Programme[23], the International Union for Conservation of Nature[24], The World Bank[25], the Chartered Institute of Ecology and Environmental Management[26], and a collaboration between the Wildlife Trusts, National Trust, the Royal Society for the Protection of Birds, Woodland Trust, Finance Earth and Federated Hermes ltd[27], have produced resources highlighting principles to consider when implementing nature markets and biodiversity offsets. There are a number of key themes which emerge across each set of principles:

1. **Implementation of the mitigation hierarchy:** prioritising avoidance of damage, minimisation, and restoration before resorting to offsets for any residual impacts (Figure 1)[23 – 27].
2. **Aim to achieve no net loss and preferably, net gain:** to qualify as an offset, conservation actions should directly result in a quantifiable increase in biodiversity, equivalent to or exceeding the residual loss of biodiversity caused by a project's impacts[24].
3. **Some biodiversity cannot be offset:** some habitats and species are so unique, culturally significant, vulnerable or difficult to regenerate that they should be considered 'irreplaceable' and cannot be offset[23 – 25, 27 – 28].
4. **Strategic planning:** the most effective offsets for biodiversity will be planned strategically. For example, by following the Lawton Principles, which stipulate that conservation interventions should consider the context of the landscape and achieve habitats that are bigger, better, and more joined up[23, 25, 26].

23 BBOP Advisory Group (2018) The BBOP Principles on Biodiversity Offsets. Washington, DC: Business and Biodiversity Offsets Programme. See: https://www.forest-trends.org/wp-content/uploads/2018/10/The-BBOP-Principles_20181023.pdf (accessed 4 September 2025).

24 International Union for Conservation of Nature (2016) IUCN Policy on Biodiversity Offsets. Gland, Switzerland: IUCN. See: https://iucn.org/sites/default/files/2022-06/iucn_biodiversity_offsets_policy_jan_29_2016_0.pdf (accessed 4 September 2025).

25 Campos, LG, Johnson, S, Reay, D (2016) Biodiversity offsets : a user guide (English) Washington, D.C. : World Bank Group. See: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/344901481176051661/biodiversity-offsets-a-user-guide (accessed 4 September 2025).

26 Chartered Institute of Ecology and Environmental Management, CIRIA, & IEMA (2016) Biodiversity net gain: Good practice principles for development. See: https://cieem.net/resource/biodiversity-net-gain-good-practice-principles-for-development/ (accessed 4 September 2025).

27 National Trust, Royal Society for the Protection of Birds, The Wildlife Trusts, The Woodland Trust, Finance Earth, & Federated Hermes Inc (2023) Nature markets principles. See: https://www.wildlifetrusts.org/sites/default/files/2023-10/Full%20-%20Nature%20Markets%20Principles%20-%20October%202023.pdf (accessed 4 September 2025).

28 Business and Biodiversity Offsets Programme (2012) Standard on Biodiversity Offsets. Washington, DC: BBOP. See: http://bbop.forest-trends.org/guidelines/Standard.pdf (accessed 4 September 2025).

5. **Science-based decisions:** nature offsetting schemes often arise following negotiation between a variety of stakeholders[29], as a result, the ecological objectives of offsetting can be under-prioritised to appease economic objectives[30, 31]. Changes in the composition, structure and functioning of biodiversity might influence the provision of ecosystem services to different stakeholders. Therefore, markets must be designed according to scientific evidence[24, 26, 28].
6. **Verifiability:** making measurements of biodiversity loss and gain verifiable ensures that the project baseline, impacts and outcomes are quantified[25, 26, 28].
7. **Transparency and public disclosure:** outcomes must be monitored and reported to maintain accountability[23 – 28].
8. **Inclusion and equity:** engaging with stakeholders at the design, monitoring and implementation stages as well as ensuring that local and indigenous communities' rights and knowledge are respected[23 – 28].
9. **Additionality:** ensure that offsets provide real, measurable and additional conservation benefits that would not have happened otherwise[23 – 27].
10. **Long-term outcomes and permanence:** biodiversity gains must be permanent and provide long-term benefits[24 – 28].

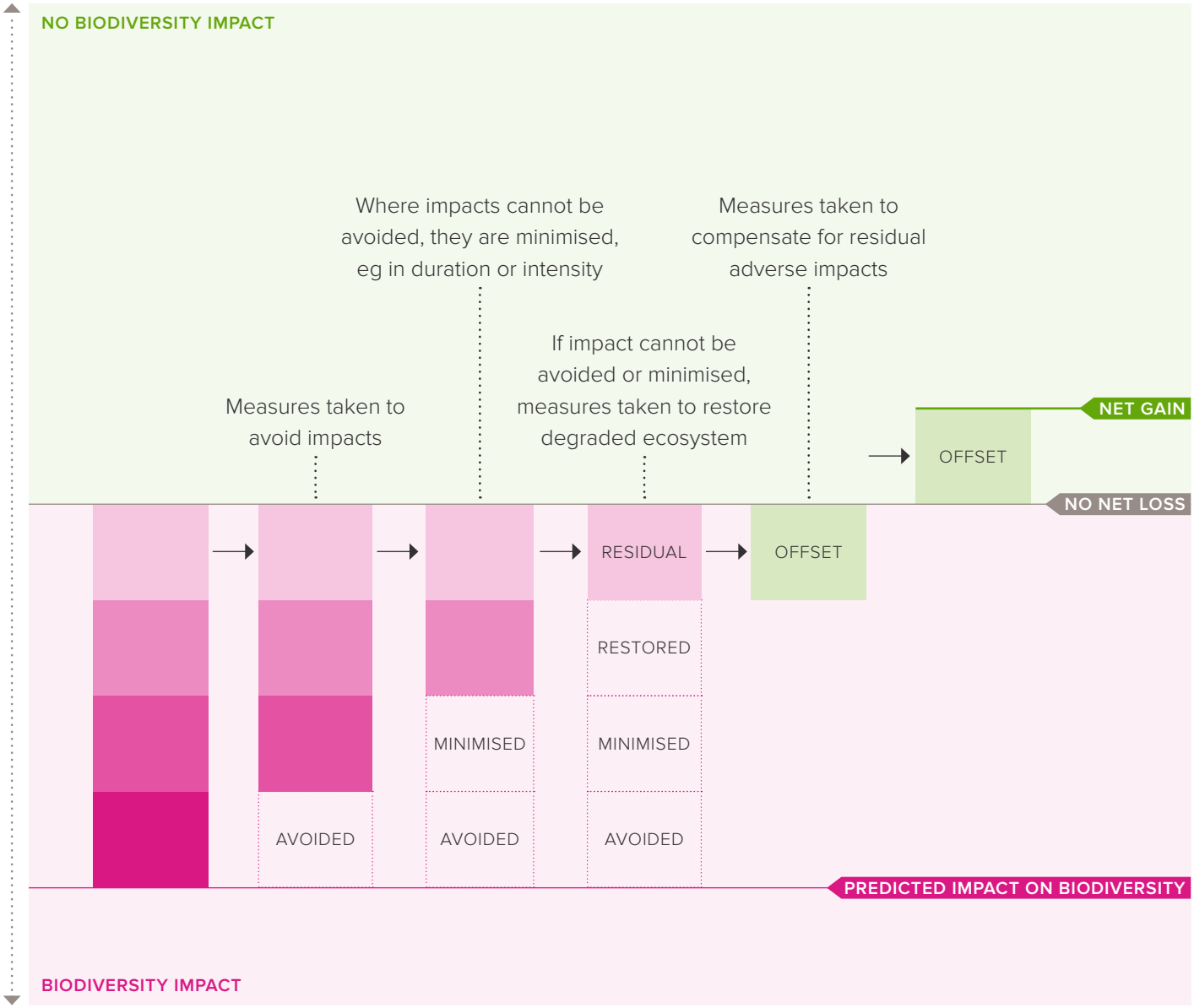
29 Miller, K L, Trezise, J A, Kraus, S, Dripps, K, Evans, M C, Gibbons, P, ... & Maron, M (2015) The development of the Australian environmental offsets policy: from theory to practice. Environmental Conservation, 42(4), 306-314. doi: 10.1017/S037689291400040X.

30 Calvet, C, Napoléone, C, & Salles, J M (2015) The biodiversity offsetting dilemma: Between economic rationales and ecological dynamics. Sustainability, 7(6), 7357-7378. doi:10.3390/su7067357.

31 Zu Ermgassen, S O, Maron, M, Walker, C M C, Gordon, A, Simmonds, J S, Strange, N, ... & Bull, J W (2020) The hidden biodiversity risks of increasing flexibility in biodiversity offset trades. Biological Conservation, 252, 108861. doi:10.1016/j.biocon.2020.108861.

FIGURE 1

Mitigation hierarchy (adapted from Rio Tinto & Government of Australia)[32]



32 Business and Biodiversity Offsets Programme (BBOP) (2013) To No Net Loss and Beyond: An Overview of the Business and Biodiversity Offsets Programme (BBOP), Washington, D.C: BBOP. See https://www.forest-trends.org/wp-content/uploads/bbop/bbop-overview-document_2012_v11_april-22_2013_web-pdf.pdf (accessed 4 September 2025).

1.2 Biodiversity Net Gain (BNG)

BNG is a conservation strategy aimed at counteracting the impacts of development on biodiversity[33]. Under Schedule 7A of the Town and Country Planning Act 1990 (as inserted by Schedule 14 of the Environment Act 2021), developers must quantify their impacts on biodiversity and ensure a ten percent uplift in biodiversity compared to the pre-development baseline. BNG was applied to major developments (defined as residential developments with 10 or more dwellings, or where the site area is greater than 0.5 hectares) from February 2024; small site developments (1 – 9 residential dwellings or where the site area is less than 0.5 hectares and commercial developments where floor space is less than 1,000 square metres or the total site area is less than 1 hectare) from April 2024 and developers of nationally significant infrastructure projects from November 2025. For the purposes of this review, we will focus on the framework applied to major developments.

To achieve BNG, pre-development biodiversity value is calculated using the statutory biodiversity metric. This converts the biodiversity value of a site into units, with developers' offsetting actions required to deliver 10% more units than the development destroyed[34]. In terms of offsetting action, BNG applies the 'biodiversity gain hierarchy', which is distinct from the mitigation hierarchy, and must be adhered to by developers to achieve BNG compliance:

1. Primarily, creation of biodiversity should be done on-site (within the red line boundary of a development site as determined by the planning application).
2. If not feasible to create on-site, developers should use a mixture of on-site and off-site either with off-site biodiversity gains on land that is owned by the developers or by purchasing off-site biodiversity units on the market. Preferably these gains are made within the same Local Planning Authority (LPA) or National Character Area (NCA) as the development, otherwise penalties will apply.
3. If developers cannot achieve on-site or off-site BNG, they must buy statutory biodiversity credits from the government[35].

Intervention measures need to be put in place for a minimum of 30 years. For off-site gains, longer-term commitments can be made if sequential contracts for different BNG projects are applied to the same piece of land[36].

As well as delivering ten percent more units than have been destroyed by development, there are some requirements around the kinds of habitat that can be used to offset the destruction of particularly important habitats. BNG employs a 'like-for-like' or 'like-for-better' approach whereby habitats that are considered ecologically distinct (as defined by the statutory biodiversity metric, outlined in section 2.3) must be replaced with the same type of habitat. Conversely, if developments occur on habitats that are not considered distinct, developers can choose to regenerate a different habitat which is considered to have the same or higher ecological distinctiveness.

33 Department for Environment, Food and Rural Affairs (2024) Understanding biodiversity net gain. See: https://www.gov.uk/guidance/understanding-biodiversity-net-gain (accessed 4 September 2025).

34 Department for Environment, Food and Rural Affairs (2023) Meet biodiversity net gain requirements: steps for developers. See: https://www.gov.uk/guidance/meet-biodiversity-net-gain-requirements-steps-for-developers (accessed 4 September 2025).

35 Department for Environment, Food and Rural Affairs (2023) Statutory Biodiversity Credits. See: https://www.gov.uk/guidance/statutory-biodiversity-credits (accessed 14 March 2024).

36 Department for Environment, Food and Rural Affairs & Natural England (2024) Combining environmental payments: Biodiversity net gain (BNG) and nutrient mitigation. See: https://www.gov.uk/guidance/combining-environmental-payments-biodiversity-net-gain-bng-and-nutrient-mitigation (accessed 10 April 2024).

1.3 Nutrient Neutrality

Nutrients in waterways can cause eutrophication (the excessive growth of algae and plants). There is strong evidence for a link between excess nutrients and subsequent eutrophication with biodiversity decline[37, 38, 39]. The main sources of excess nutrients (such as phosphorus and nitrogen) in UK rivers and lakes are sewage effluent (both treated and untreated) and agricultural run-off[40, 41]. Housing development can increase nutrient levels in local watercourses both during construction on undeveloped land via nitrate leaching into groundwater[42], and after occupation through increased sewage overflows if local treatment capacity is not increased accordingly[40]. Nutrient Neutrality is intended to ensure that proposed new developments, which will increase the number of homes or overnight occupants in an area, do not make an already bad situation worse in catchments that are in 'unfavourable condition' due to an excess of nutrient pollution[41]. It is not intended to improve on the baseline conditions in the catchment and does not address all the drivers of poor water quality in a catchment.

The Conservation of Habitats and Species Regulations 2017 established protections for sites in England that are considered important for nature[43]. At the time of writing in 2024, 27 of these protected habitat sites are in 'unfavourable condition'. Developments in the catchment area of these 27 sites are subject to the requirements of Nutrient Neutrality, impacting 72 Local Planning Authorities (LPAs; Figure 2). For developments in these LPAs to go ahead, a Habitats Regulations Assessment (HRA) must demonstrate a neutral impact of the proposed development on nutrient levels[44]. This is done by calculating a nutrient budget which considers the increased nutrient loading that will occur because of the development as well as the nutrient loading from current land use.

37 Ceulemans, T, Stevens, C J, Duchateau, L, Jacquemyn, H, Gowing, D J, Merckx, R, … & Honnay, O (2014) Soil phosphorus constrains biodiversity across European grasslands. Global Change Biology, 20(12), 3814-3822. doi: 10.1111/gcb.12650.

38 Jwaideh, M A, Sutanudjaja, E H, & Dalin, C (2022) Global impacts of nitrogen and phosphorus fertiliser use for major crops on aquatic biodiversity. The International Journal of Life Cycle Assessment, 27(8), 1058-1080. doi: 10.1007/s11367-022-02078-1.

39 Cleland, E E, & Harpole, W S (2010) Nitrogen enrichment and plant communities. Annals of the New York Academy of Sciences, 1195(1), 46-61. doi: 10.1111/j.1749-6632.2010.05458.x.

40 Environment Agency (2022) Phosphorous challenges for the water environment. See: https://www.gov.uk/government/publications/phosphorus-challenges-for-the-water-environment (accessed 4 September 2025).

41 Environment Agency (2021) Nitrates: challenges for the water environment. See: https://www.gov.uk/government/publications/nitrates-challenges-for-the-water-environment (accessed 4 September 2025).

42 Wakida, F T, & Lerner, D N (2006) Potential nitrate leaching to groundwater from house building. Hydrological Processes: An International Journal, 20(9), 2077-2081. doi:10.1002/hyp.6143.

43 UK Government (2017) The Conservation of Habitats and Species Regulations 2017 (SI 2017/1012). See: https://www.legislation.gov.uk/uksi/2017/1012/contents (accessed 4 September 2025).

44 Rankl, F (2023) Nutrient neutrality and housing development (House of Commons Library Research Briefing No CBP-9850). House of Commons Library. See: https://researchbriefings.files.parliament.uk/documents/CBP-9850/CBP-9850.pdf (accessed 4 September 2025).

Developments which will produce additional nutrient load require mitigation measures, that must be either on-site or in the same catchment as the development. These measures need to be effective for the lifetime of the development project, normally defined as 80 to 125 years[45].

Measures to offset nutrients include:

Nature-based solutions[46]

- Creating or restoring semi-natural habitats.
- Creating a treatment wetland that is specifically designed to capture run-off from agricultural land or wastewater treatment works.
- Taking land out of use if the current land use results in an excess of nutrient pollution eg through the application of fertiliser[44].

Non-nature-based solutions

- Upgrading existing sewage treatment plants and septic tank units or establishing new wastewater treatment works.

If the adverse effects of a proposed development on a protected habitat site cannot be avoided or mitigated, the LPA is expected to refuse the proposed development. The exception to this is if they consider the development to be in the public interest.

To expedite the delivery of nature-based solutions, in 2022 the government announced that Natural England would set up a nutrient mitigation scheme to make 'nutrient credits' available for developers to meet their Nutrient Neutrality requirements. Natural England is also able to accredit mitigation projects with Nutrient Credit Certificates, indicating that projects meet the requirements of the Habitats Regulations and increasing LPA confidence to approve projects[47]. Under the scheme, Natural England is creating and expanding wetlands and woodlands to reduce nutrient pollution in water courses in affected areas. However, credits from the Natural England schemes are limited and are released periodically. As a result, private markets are also emerging, such as in the Tees catchment, Norfolk Environmental Credits[48] and through EnTrade which operate Bristol Avon, Somerset and Solent markets[49].

45 Natural England (2023) Nutrient Neutrality Principles (TIN186). See: https://publications.naturalengland.org.uk/publication/5031421117988864 (accessed 4 September 2025).

46 Nature-based solutions: leveraging natural systems for the restoration, protection and management of nature (https://www.naturebasedsolutionsinitiative.org/what-are-nature-based-solutions/) (accessed 4 September 2025).

47 Natural England (2022) Nutrient Neutrality and Mitigation: A summary guide and frequently asked questions (NE776). See: https://publications.naturalengland.org.uk/publication/6248597523005440 (accessed 4 September 2025).

48 Norfolk Environmental Credits (n.d.). Norfolk Environmental Credits – Buying. See: https://www.norfolkenvironmentalcredits.co.uk/buying/ (accessed 3 May 2024).

49 EnTrade (2025) Local nature markets across the UK. See: https://www.entrade.co.uk/nature-markets (accessed 3 May 2024).

FIGURE 2

Nutrient neutrality catchments in England

Affected LPAs

1 Nitrate

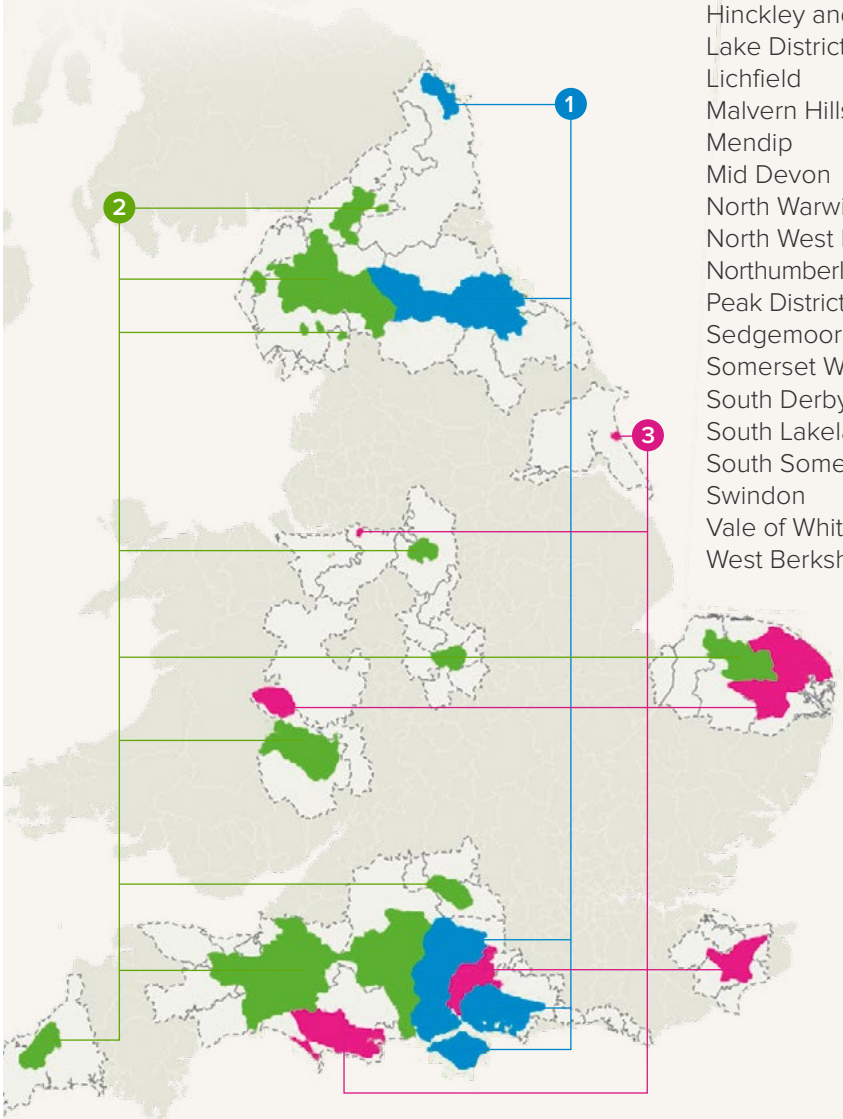
Darlington
Hambleton
Hartlepool
Isle of Wight
Middlesbrough
North York Moors National Park
Redcar and Cleveland
Stockton-on-Tees

2 Phosphate

Allerdale
Carlisle
Copeland
Cornwall
Derbyshire Dales
East Devon
East Staffordshire
Exmoor National Park
High Peak
Hinckley and Bosworth
Lake District National Park
Lichfield
Malvern Hills
Mendip
Mid Devon
North Warwickshire
North West Leicestershire
Northumberland National Park
Peak District National Park
Sedgemoor
Somerset West and Taunton
South Derbyshire
South Lakeland
South Somerset
Swindon
Vale of White Horse
West Berkshire

3 Phosphate and nitrate

Ashford
Basingstoke and Deane
Bournemouth, Christchurch, Poole
Breckland
Broadland
Canterbury
Cheshire East
Cheshire West and Chester
Chichester
County Durham
Dorset
East Hampshire
East Riding of Yorkshire
Eastleigh
Eden
Fareham
Folkestone and Hythe
Gosport
Great Yarmouth
Havant
Herefordshire
King's Lynn and West Norfolk
Maidstone
New Forest
New Forest National Park
North Norfolk
Northumberland
Norwich
Portsmouth
Richmondshire
Shropshire
South Downs National Park
South Norfolk
Southampton
Swale
Test Valley
The Broads Authority
Wiltshire
Winchester



Source: Knight Frank Research / Natural England.

How do England's nature offset markets measure biodiversity?

A major challenge for nature offset markets is that biodiversity is intrinsically complex and therefore difficult to quantify[50]. Biodiversity metrics aim to assess the diversity of biological life, using either single or composite measures which utilise species richness (ie the number of species present within a defined habitat), species rarity, species evolutionary histories, or habitat characteristics and area[51]. At present, there is no consensus on a metric that effectively captures all aspects of biodiversity, hence the uncertainty around the extent to which any of these metrics provide a good proxy for biodiversity[50].

Furthermore, trading necessitates commodities that are fungible. Fungibility refers to simple, measurable, and directly comparable units[52]. Units of biodiversity need to be fungible for gains and losses of biodiversity to be balanced and verified (section 1.1). Critics of nature offsetting argue that biodiversity is non-fungible, meaning a unit of biodiversity in one place is not necessarily equivalent to a unit of biodiversity somewhere else. This is because it is almost impossible to recreate the complex set of species and habitat interactions that give biodiversity its value. For the same reason, it cannot be guaranteed that replacement habitats will provide the same ecosystem services as habitats that have been lost.

Discussion of ecosystem services raises a further challenge for fungibility – whether biodiversity is valued for what it is or what it does. Some policy goals, such as the Environment Act's targets for reducing the risk of species going extinct and increasing overall species abundance, focus on biodiversity for the sake of biodiversity. Others, such as the Sustainable Farming Incentive's support for Integrated Pest Management, value biodiversity for the benefits provided to humanity, in this case helping to control farmland pest populations. The two are obviously connected – without any nature there would not be any benefits from nature for people – but the relationships between the two are very complex. This makes it hard to establish causal relationships, which in turn makes it hard to value a given change to biodiversity.

This complexity means efforts to integrate biodiversity into decision-making processes face a trade-off between accuracy and simplicity[53]. A simple basis for decisions is easily collected information on what nature is, but as discussed above this is hard to do comprehensively (which could lead to poor outcomes for nature) and risks misvaluing what nature does for people. Ideally, metrics should reflect the provision of ecosystem services and welfare attributes that are delivered by biodiversity in order to be effective (section 1.1). The inability to effectively represent biodiversity in a single metric and the potential non-fungibility of biodiversity mean that the choice of measurement unit is complex and will likely impact the outcomes for voluntary and compliance-based offset schemes[54].

50 Purvis, A, & Hector, A (2000) Getting the measure of biodiversity. Nature, 405(6783), 212-219. doi:10.1038/35012221.

51 Davies, TJ, Cadotte, MW (2011) Quantifying Biodiversity: Does It Matter What We Measure?. In: Zachos, F., Habel, J. (eds) Biodiversity Hotspots. Springer, Berlin, Heidelberg. doi:10.1007/978-3-642-20992-5_3.

52 Walker, S, Brower, A L, Stephens, R T, & Lee, W G (2009) Why bartering biodiversity fails. Conservation Letters, 2(4), 149-157. doi: 10.1111/j.1755-263X.2009.00061.x.

53 Kangas, J, Kullberg, P, Pekkonen, M, Kotiaho, J S, & Ollikainen, M (2021) Precision, applicability, and economic implications: A comparison of alternative biodiversity offset indexes. Environmental Management, 68(2), 170-183. doi:10.1007/s00267-021-01488-5.

54 Simpson, K H, de Vries, F P, Dallimer, M, Armsworth, P R, & Hanley, N (2022) Ecological and economic implications of alternative metrics in biodiversity offset markets. Conservation biology, 36(5), e13906. doi:10.1111/cobi.13906.

Given the complexity of assessing the state of nature and linking such assessments to the provision of ecosystem services, other biodiversity metrics instead focus on the drivers of biodiversity loss such as pollution. For the purposes of nature offset markets, such metrics can avoid the challenge of fungibility by ensuring impacts and offsets are comparable eg one kilo of nitrogen removed for every kilo of nitrogen added. However, because such measures only have an indirect connection to the state of biodiversity, it is not a given that an offset undoes the damage of an action. For example, if pollution from a development pushes an ecosystem past a tipping point, then subsequent removal of that pollution might not restore that ecosystem to its previous state[55].

2.1 How is the nutrient budget for Nutrient Neutrality calculated?

Nutrient Neutrality measures the level of nutrient pollution produced by a development to calculate a nutrient budget. In this way, Nutrient Neutrality measures a direct driver of biodiversity loss, rather than trying to quantify biodiversity loss itself. Calculating a nutrient budget involves predicting the level of additional nutrient loading caused by a new development, while also considering the pre-existing nutrient loading from current land use within that catchment. The generic nutrient budget calculation methodology is outlined below[56].

Stage 1
Calculates the increase in nutrient loading from additional wastewater because of a new development, considering the increase in population and the subsequent changes in volume of wastewater production as well as nutrient concentration in wastewater.

Stage 2
Calculates the nutrient loading from current land uses.

Stage 3
Calculates the nutrient loading from the proposed new development.

Stage 4
Calculates the removed nutrient load from installing sustainable urban drainage systems, if applicable.

Stage 5
Uses the results from the first four stages to calculate the nutrient budget, the final budget includes a buffer (x1.2) to account for any residual uncertainties in the budget calculation.

55 Lenton, T M (2013) Environmental tipping points. Annual review of Environment and Resources, 38(1), 1-29. doi:10.1146/annurev-environ-102511-084654.

56 Ricardo and Natural England (2022) Nutrient Neutrality Generic Methodology. NECR459. Natural England.

2.2 Does Nutrient Neutrality address biodiversity decline?

By considering a driver of biodiversity loss, such as pollution, rather than measuring biodiversity itself, some of the complexity around fungibility is avoided for Nutrient Neutrality. Moreover, there is a requirement for offsets to be carried out as close to the site of development as possible and to be put in place prior to project commencement. However, a review of the evidence base on the extent to which nature-based interventions delivered effective nutrient mitigation concluded that there was only sufficient evidence to make a quantitative nutrient reduction estimate for one of the four interventions analysed[57]. It is also difficult to determine whether changes in nutrient levels has a net effect on delivery of some ecosystem services. Therefore, even an apparently direct measure of a driver of biodiversity loss may not capture the value of ecosystem services delivered[58].

There are further concerns that other factors can also contribute to excess nutrients. For example, seepage of nutrient-rich 'old' groundwater and sediments that are not incorporated in the nutrient budget assessments[59]. It should also be noted that wastewater treatment plants are the primary source of phosphorus nutrient pollution[8]. Therefore, without compliance from wastewater treatment facilities, Nutrient Neutrality alone may not be sufficient to address issues with nutrient pollution in England's waterways.

57 Lloyd, P, Mant, J, Yellowlees, R, Connor-Streich, G, Jones, C (2024) Evidence base development for nature-based nutrient mitigation solutions. NECR538. Natural England. See: https://publications.naturalengland.org.uk/publication/6621036603506688 (accessed 4 September 2025).

58 Keeler, B L, Polasky, S, Brauman, K A, Johnson, K A, Finlay, J C, O'Neill, A, ... & Dalzell, B (2012) Linking water quality and well-being for improved assessment and valuation of ecosystem services. Proceedings of the National Academy of Sciences, 109(45), 18619-18624. doi:10.1073/pnas.121599110.

59 Oenema, O, van Liere, L, & Schoumans, O (2005) Effects of lowering nitrogen and phosphorus surpluses in agriculture on the quality of groundwater and surface water in the Netherlands. Journal of Hydrology, 304(1-4), 289-301. doi: 10.1016/j.jhydrol.2004.07.044.

2.3 What is the statutory biodiversity metric for biodiversity net gain?

Unlike Nutrient Neutrality, BNG is based on a measure of biodiversity – the type and condition of habitats – rather than a driver of biodiversity loss. The statutory biodiversity metric converts data on habitats into fungible biodiversity units[60]. According to the metric, habitats are categorised into broad types (grassland, hedgerows, lakes, woodland, and watercourses). These broad types are then further categorised into more specific habitats according to either the UKHab classification system for terrestrial habitats or EUNIS for inter-tidal habitats. Each habitat has a pre-assigned distinctiveness score (low to very high) based on its national-scale rarity, proportion of habitat protected in sites of special scientific interest (SSSI), UK priority habitat status (as defined by UK Biodiversity Action Plan), and the European Red List habitat categories[61, 62]. The metric also accounts for the size of each 'habitat parcel' as well as habitat condition. Condition (categorised as 1 – 3) is assessed differently depending on the habitat type and is based on the presence or absence of certain plant species[63].

The metric also includes several multipliers, these are intended to encourage or discourage particular conservation interventions in particular places as well as compensate for the risk incurred by the certain destruction of nature for the promise of uncertain gains[64]. The multipliers are applied in either the baseline assessment (pre-intervention) or to the calculations for the proposed offset (post-intervention). Each multiplier and its impact on the overall biodiversity unit calculation is outlined in Table 2.

Because the metric focuses on a measure of what nature is, Natural England and the University of Oxford in partnership with Defra, the Forestry Commission and the Environment Agency, have developed a complementary measure of what nature does – the Environmental Benefits from Nature Tool – that is intended to work alongside the statutory biodiversity metric. This tool assesses the impact of land-use change on the delivery of 18 ecosystem services, including flood management, recreation and air quality. It aims to deliver wider benefits to people and nature and encourage multifunctional landscape use[65, 66]. However, the tool is currently in its beta phase of development and applying its application to BNG projects is currently voluntary.

60 Department for Environment, Food and Rural Affairs (2021) Calculate biodiversity value with the statutory biodiversity metric. Accessed 11 Apr 2024. See: https://www.gov.uk/guidance/biodiversity-metric-calculate-the-biodiversity-net-gain-of-a-project-or-development (accessed 4 September 2025).

61 Treweek, J, Butcher, B, & Temple, H (2010) Biodiversity offsets: possible methods for measuring biodiversity losses and gains for use in the UK. Practice, 69(18), 29-32.

62 Marshall, C A, Wade, K, Kendall, I S, Porcher, H, Poffley, J, Bladon, A J, ... & Treweek, J (2024) England's statutory biodiversity metric enhances plant, but not bird nor butterfly, biodiversity. Journal of Applied Ecology, 61(8), 1918-1931. doi:10.1111/1365-2664.14697.

63 Department for Environment, Food and Rural Affairs (2021) The statutory biodiversity metric – Technical annex 1: Condition assessment sheets and methodology. See: https://assets.publishing.service.gov.uk/media/669e5db4fc8e12ac3edb0198/Statutory_Biodiversity_Metric_Condition_Assessments23.07.24.xlsx (accessed 4 September 2025).

64 Bull, J W, Suttle, K B, Gordon, A, Singh, N J, & Milner-Gulland, E J (2013) Biodiversity offsets in theory and practice. Oryx, 47(3), 369-380. doi:10.1017/S003060531200172X.

65 Natural England (n.d.). Environmental Benefits from Nature Tool (EBNT). See: https://designatedsites.naturalengland.org.uk/GreenInfrastructure/EBNT.aspx (accessed 4 September 2025).

66 Smith, A C A, Brown, J B, Patel, M A, Thomas, C C, Andrews, E H..., & White, J E (2024) Principles of the Environmental Benefits from Nature (EBN tool) approach (Beta Version 1.1). Natural England. See: https://designatedsites.naturalengland.org.uk/GreenInfrastructure/EBNT.aspx (accessed 4 September 2025).

TABLE 2

Summary of each multiplier included in the metric

This table includes detail on how each multiplier's value is calculated, the overall impact it can have on the number of units, the rationale underpinning its inclusion in the metric and whether the multiplier is included in pre- or post-intervention calculations (ie whether or not the multiplier is included in baseline calculations). For strategic significance, not all Local Nature Recovery Strategies (LNRSs) have been published. In such cases, LPAs must publicly communicate which other strategy or plan will be used to determine strategic significance until an LNRS is available.

Multiplier name	Rationale for inclusion	Impact on biodiversity unit calculation	Methodology	Stages applied
Strategic significance	To encourage offsetting at sites that have already been identified as high priority for conservation	Up to 15% increase in units	**x1: habitat intervention** not in Local Nature Recovery Strategy (LNRS) and not publicly communicated as being of strategic importance **x1.1:** LNRS is not yet published but intervention has been identified as strategic **x1.15:** location and habitat intervention identified in LNRS	Pre- and post-intervention
Temporal risk	To discourage temporal mismatches between the destruction and regeneration of biodiversity	Up to 68% reduction in units	Equal to standard time to target condition (in years) **minus** habitat enhanced in advance (in years) **plus** delay in the start date of the project (in years)	Post-intervention
Difficulty risk	To prevent developers from making risky promises and over-committing on the biodiversity they can deliver	Up to 67% reduction in units	**x0.33:** habitat generation considered highly difficult. **x0.67:** habitat considered moderately difficult to restore **x1:** habitat generation considered relatively easy	Post-intervention
Spatial risk	To prevent communities from losing local access to biodiversity and ensure that offsets are as close to the site of impact as possible	Up to 50% reduction in units	**x1:** offset location within LPA or NCA **x0.75:** offset location in neighbouring LPA or NCA **x0.5:** offset outside LPA or NCA	Post-intervention

Does BNG comply with the principles of good nature offset market design?

This section assesses the extent to which BNG, as currently implemented, fulfils the principles for designing effective nature offset markets set out in section 1.1 and the likelihood that the policy will achieve its goal of net gain of biodiversity.

3.1 Strategic planning

It is widely understood that biodiversity conservation needs to be strategic, as reflected in the Government's commitment to develop a land-use framework for England. In terms of a framework for strategic conservation, the priorities set out in the 2010 Lawton review[67] of habitats that are bigger, better, and more joined up, while efficiently coordinating land-based activity, remain valid and have informed recent policies such as the 25 Year Environment Plan. See Box 2 for further detail on the Lawton review.

BOX 2

Summary of the Lawton Review, Making Space for Nature

The Lawton review (2010), titled Making Space for Nature, evaluated England's wildlife sites and ecological networks. It concluded that England's nature was not resilient to the impact of climate change or habitat fragmentation. The review called for a step-change in nature conservation, outlining a vision for a connected, wildlife-rich landscape capable of supporting biodiversity and ecosystem services as well as providing a nature-rich environment for the public to enjoy. The key recommendations from the Lawton review are summarised below.

Bigger: Increase the size of existing patches of nature to support larger species populations which in turn support more genetic diversity.

Better: Improve the condition of habitats to better support a diverse range of species, improving ecological health and resilience.

More joined-up: Enhance connectivity by creating wildlife corridors, stepping stones and reducing habitat fragmentation.

More: Create new wildlife sites to increase overall habitat availability.

Protect, enhance and improve: Strengthen the protection of current sites and use management strategies that promote ecological restoration across landscapes such as wildlife corridors.

Strategic planning: Incorporate nature into land-use planning and focus on landscape-scale approaches, rather than isolated reserves, to create resilient ecological networks.

What is connectivity?

Several of the Lawton Review's recommendations promote the concept of connectivity. Habitats that are 'more joined up' effectively become larger habitat patches, with sufficient resources to support more individuals. Joined up habitat patches also facilitate individual movement and the subsequent flow of genetic information among populations. Bigger populations with more genetic variation are more likely to be able to adapt to changing conditions, thus improving ecosystem resilience.

67 Lawton, J H (2010) Making space for nature: A review of England's wildlife sites and ecological network. Department for Environment, Food and Rural Affairs. https://webarchive.nationalarchives.gov.uk/ukgwa/20130402170324/https://www.researchgate.net/profile/William-Sutherland-3/publication/268279426_Making_Space_for_Nature_A_Review_of_England's_Wildlife_Sites_and_Ecological_Network/links/5567846e08aeab77721eaa34/Making-Space-for-Nature-A-Review-of-Englands-Wildlife-Sites-and-Ecological-Network.pdf (accessed 4 September 2025).

This section assesses the extent to which habitat creation under BNG is consistent with the principles of the Lawton review.

3.1.1 BNG does not lead to bigger habitat patches

The Lawton review highlights that bigger habitat patches can support more species and larger populations; these larger populations are likely to support a greater level of genetic diversity. Furthermore, establishing larger habitat patches is likely to reduce edge effects, an ecological phenomenon whereby the boundary of a habitat experiences different ecological conditions to the centre, due to pressures such as human disturbance. Therefore, larger habitat patches are likely to be better able to support biodiversity and be more resilient to the effects of climate change than small patches.

The current BNG framework may lead to a reduction in overall land area for biodiversity. Within the current framework, larger areas of land to be developed can be traded for smaller areas of habitat to be created if they are perceived to be of higher distinctiveness or condition. For early adopters of BNG, an analysis has found a 34% reduction in total area of non-urban green space[68].

3.1.2 BNG may not deliver better habitat patches

In terms of the Lawton Principles, 'better' refers to the ecological condition of a habitat. Habitats that are in good ecological condition are likely to support a greater range of species, provide a variety of ecosystem functions and are likely to be more resilient towards climate change. In theory, the 'like-for-like' or 'like-for-better' provisions should ensure delivery of habitats that are in at least as good ecological condition. However, as will be discussed in greater detail in section 3.2.1, there is some evidence that the way the statutory biodiversity metric assesses ecological condition disadvantages certain taxonomic groups. There is also a concern, discussed in detail in section 3.3.1, that the dependence on subjective assessments risks habitat condition being determined in a way that favours developers. For example, if a baseline assessment classifies a habitat as being in a poorer condition than it actually is, then a post-intervention assessment will suggest there has been an improvement without any effort from the developer.

68 zu Ermgassen, S O, Marsh, S, Ryland, K, Church, E, Marsh, R, & Bull, J W (2021) Exploring the ecological outcomes of mandatory biodiversity net gain using evidence from early-adopter jurisdictions in England. Conservation Letters, 14(6), e12820. doi: 10.1111/conl.12820.

Furthermore, the spatial multiplier was introduced to encourage developers to offset within the LPA or NCA of the site of impact. There are several benefits associated with offsetting within the same landscape as the development[69]. For example, local loss of nature can limit peoples' access to greenspace[70, 71]. Access to green space has been proven to be important for mental and physical health as well as increasing the perceived value of nature[72, 73]. Offsetting close to the site of impact could also minimise the displacement of biodiversity and potentially avoid local loss of ecosystem function.

However, the spatial multiplier in combination with the biodiversity gains hierarchy, strongly encourages developers to deliver mitigation measures on-site. This is likely to reduce the quality of the habitat, particularly for those species most affected by proximity to human disturbance. For example, excrement from recreational dog walking is a well-documented source of nutrient pollution[74], and has been linked to eutrophication and algal blooms[75, 76].

Similarly, urbanisation has been shown to have a negative impact on certain groups of organisms, such as terrestrial arthropods[77]. Therefore, on-site offsets are likely to face challenges to achieving improved ecological condition. Obtaining a balance between on and off-site biodiversity gains is essential. Yet, data from early adopters suggests that up to 95% of offsets are being delivered on or directly adjacent to the development site[67].

3.1.3 BNG does not incentivise habitat patches that are more joined up

The spatial context of biodiversity conservation is paramount to its success. As discussed in Box 2, the Lawton Principles assert that connectivity between habitat patches is important to support a larger diversity of species and bigger populations.

At present, the inclusion of the strategic significance multiplier is intended to integrate spatial connectivity into the statutory biodiversity metric. It is expected that sites of strategic significance, potentially due to their connectivity, are identified in the LNRSs.

69 McKenney, B A, & Kiesecker, J M (2010) Policy development for biodiversity offsets: a review of offset frameworks. Environmental management, 45, 165-176. doi:10.1007/s00267-009-9396-3.

70 Kalliolevo, H, Gordon, A, Sharma, R, Bull, J W, & Bekessy, S A (2021) Biodiversity offsetting can relocate nature away from people: An empirical case study in Western Australia. Conservation Science and Practice, 3(10), e512. doi:10.1111/csp2.512.

71 Apostolopoulou, E, & Adams, W M (2017) Biodiversity offsetting and conservation: reframing nature to save it. Oryx, 51(1), 23-31. doi:10.1017/S0030605315000782.

72 Bratman, G N, Hamilton, J P, & Daily, G C (2012). The impacts of nature experience on human cognitive function and mental health. Annals of the New York academy of sciences, 1249(1), 118-136. doi:10.1111/j.1749-6632.2011.06400.x.

73 Díaz, S, Demissew, S, Joly, C, Lonsdale, W M, & Larigauderie, A (2015) A Rosetta Stone for nature's benefits to people. PLoS Biology, 13(1), e1002040. doi:10.1371/journal.pbio.1002040.

74 Bryson, E, Anastasi, A, Bricknell, L, & Kift, R (2024) Household dog fecal composting: Current issues and future directions. Integrated Environmental Assessment and Management, 20(6), 1876-1891. doi:10.1002/ieam.4970.

75 Leon, M (2024) Dog owners and their dogs' influence on the blue-green algae blooms at Shubie Off-Leash Dog Park, Dartmouth, NS (Unpublished undergraduate thesis). Dalhousie University.

76 Waajen, G, van Oosterhout, F, Douglas, G, & Lürling, M (2016) Geo-engineering experiments in two urban ponds to control eutrophication. Water research, 97, 69-82. doi:10.1016/j.watres.2015.11.070.

77 Fenoglio, M S, Rossetti, M R, & Videla, M (2020) Negative effects of urbanization on terrestrial arthropod communities: A meta-analysis. Global Ecology and Biogeography, 29(8), 1412-1429. doi:10.1111/geb.13107.

Yet, while the government have pledged £14 million to deliver LNRSs across England before March 2025[78], few LNRSs have been published to date, meaning that, at the time of writing, they are not currently available in most places to inform BNG assessments. Further, LNRSs will not be developed using the UKHab framework (the framework used to assess habitat type for BNG), potentially reducing the translatability of LNRSs to BNG projects. The availability of resources to inform LNRSs also varies considerably across the country. For example, data generated from Local Nature Partnerships (LNPs) could represent a useful resource for informing LNRSs[79] but LNPs were not established in every area, eg Essex[80]. As a result, it is not clear whether the quality of LNRSs will be consistent between local authorities. In addition, LNRSs are required to be republished every 3 – 10 years[81]. Therefore, published LNRSs may not necessarily reflect the current situation for strategic biodiversity conservation in the local area. Failing to include connectivity directly in the statutory biodiversity metric could lead to increasingly fragmented landscapes and consequent reduced ecosystem service provision[82].

Overall, it appears that the current framework for biodiversity net gain could result in habitat patches that are smaller, in worse condition for some taxonomic groups and are not necessarily connected to one another. As a result, the BNG framework is unlikely to achieve strategic conservation action.

3.2 Science-based decisions

The scientific definition of biodiversity covers diversity at the genetic, species and ecosystem levels. As discussed in the previous section, there is a risk that BNG does not deliver bigger and more joined up habitats, which in turn risks diversity at the species and genetic level. This section assesses how effectively the statutory biodiversity metric assesses diversity at the species level and whether there is a risk to reduction in diversity at the ecosystems level.

78 Benyon, R (2023) Nature recovery statement. UK Parliament. See: https://questions-statements.parliament.uk/written-statements/detail/2023-07-03/HCWS906 (accessed 4 September 2025).

79 Wentworth, J, & Powel, K (2021) Local nature recovery strategies (POSTnote No. 646). UK Parliament Parliamentary Office of Science and Technology. See: https://post.parliament.uk/research-briefings/post-pn-0652/ (accessed 4 September 2025).

80 UK Parliament (2015) Local Nature Partnerships audit. See: https://publications.parliament.uk/pa/cm201415/cmselect/cmenvaud/858/85802.htm (accessed 4 September 2025).

81 Department for Environment, Food and Rural Affairs (2023) Local nature recovery strategy statutory guidance. See: https://assets.publishing.service.gov.uk/media/6421a4bdfe97a8001379ecf1/Local_nature_recovery_strategy_statutory_guidance.pdf (accessed 4 September 2025).

82 Karimi, J D, Corstanje, R, & Harris, J A (2021) Bundling ecosystem services at a high resolution in the UK: Trade-offs and synergies in urban landscapes. Landscape Ecology, 36(6), 1817-1835. doi:10.1007/s10980-021-01252-4.

3.2.1 Relevance to species diversity

Due to the difficulty of measuring highly complex ecological systems, taking a holistic approach to the conservation of habitats and safeguarding space for nature has been highlighted as critical to the success of conservation[83]. BNG's use of habitats as the focus of measurement is consistent with evidence that the use of area-based conservation targets[84], which aim to make space for nature, may have a higher chance of success than focussing on the presence of specific species. This is because habitat can be a good proxy for species diversity (the number of different species present in a particular place)[85]. However, there is evidence that habitats that score well on the statutory biodiversity metric do not necessarily promote species diversity for butterflies and birds[61]. There is also evidence that habitat features like tall ruderal herbs eg thistles and meadowsweet, and excessive patches of bare earth, leads to habitat condition being classified as poor[86, 87]. These features are important for supporting invertebrate populations that deliver ecosystem services like pollination. Given policy objectives to halt and reverse species loss by 2030 it will be important to assess whether the way the BNG metric values habitat is contributing to declines in 'at risk' species in the UK.

3.2.2 Relevance to ecosystem diversity

A challenge for any offsetting framework is how to allow for the uncertainties associated with any intervention that seeks to create or enhance habitats[26]. BNG attempts to account for this uncertainty by incorporating time and difficulty multipliers into the metric calculation, which represent the risk of habitat delivery (Table 2). There are several consequences that may arise from this decision. Primarily, the use of risk multipliers in combination with the 'trading up' policy enables some habitat parcels of low or medium distinctiveness to be traded for different habitat types. This could lead to the uneven replacement of habitats, potentially allowing destroyed and replaced habitats to become increasingly disparate[31], and ultimately providing different ecosystem services.

Similarly, the weightings attributed to each multiplier are likely to have significant impacts on the types of habitats that are generated under BNG. While the strategic significance multiplier, which acts to encourage ecologically important restoration projects, can impact the overall units by a maximum of 15%, the difficulty and distance multiplier can mean a reduction in 67% or 50% of units respectively (Table 2). This is likely to deter developers from attempting to restore or create certain habitats which score poorly on the metric but are none-the-less ecologically valuable, such as calcareous grassland (Box 3). Instead, it is likely that BNG will result in the creation of more high scoring habitats, such as neutral grassland.

83 Maxwell, S L, Cazalis, V, Dudley, N, Hoffmann, M, Rodrigues, A S, Stolton, S, ... & Watson, J E (2020) Area-based conservation in the twenty-first century. Nature, 586(7828), 217-227. doi:10.1038/s41586-020-2773-z.

84 Dudley, N, & Stolton, S (2020) Leaving Space for Nature: The Critical Role of Area-Based Conservation (1st ed.). Routledge. doi:10.4324/9780367815424.

85 Bunce, R G H, Bogers, M M B, Evans, D, Halada, L, Jongman, R H G, Mucher, C A, ... & Olsvig-Whittaker, L (2013) The significance of habitats as indicators of biodiversity and their links to species. Ecological indicators, 33, 19-25. doi:10.1016/j.ecolind.2012.07.014.

86 Falk, S (2021) Comments on the Biodiversity Net Gain Metric 3.0. Technical Report. doi:10.13140/RG.2.2.19630.28485.

87 Duffus, N E, Lewis, O T, Grenyer, R, Comont, R F, Goddard, D, Goulson, D, ... & zu Ermgassen, S O (2024) Leveraging Biodiversity Net Gain to address invertebrate declines in England. Insect Conservation and Diversity. doi:10.1111/icad.12820.

BOX 3

The statutory biodiversity metric unintentionally incentivises the creation of less distinctive, less risky habitats

Neutral grassland scores highly on the statutory biodiversity metric despite not necessarily representing high value for biodiversity[88]. This is because it does not incur time or difficulty penalties during biodiversity unit calculations. Furthermore, the temporal risk multiplier is exclusively applied in the post-intervention calculations, penalising habitats that take a long time to mature.

Habitats that take a long time to mature, such as lowland calcareous grassland, could be systematically disadvantaged by the metric due to the temporal risk and difficulty multipliers. These habitats are therefore unlikely to be regenerated under BNG.

The table below provides a worked example comparing the statutory biodiversity units calculated using biodiversity metric 4.0 for off-site habitat creation of lowland calcareous grassland and other neutral grassland. This assumes that neither grassland is in an area of strategic significance, both grasslands are of the same size and condition, and that no habitat has been created in advance.

Type	Other neutral grassland	Lowland calcareous grassland
Area (ha)	1	1
Distinctiveness	Medium (4)	High (6)
Condition	Moderate (2)	Moderate (2)
Strategic significance	Low strategic significance (x1)	Low strategic significance (x1)
Final time to target multiplier	0.84	0.70
Time to target condition	5	10
Habitat created in advance (years)	0	0
Delay in starting habitat creation (years)	0	0
Standard difficulty creation	Low (x1)	High (x0.33)
Total units	**6.69**	**2.77**

88 Gowing, D J G (n.d.). What exactly is neutral grassland and how should we make the best of it? Chartered Institute of Ecology and Environmental Management (CIEEM). https://cieem.net/what-exactly-is-neutral-grassland-and-how-should-we-make-the-best-of-it/ (accessed XX Month 2025).

3.2.3 The application of a universal difficulty multiplier does not account for context

Restoration ecology is a developing science and there are several knowledge gaps with regards to the difficulty and time required to restore certain habitats[89, 90]. Therefore, some of the assigned risk multipliers may be inaccurate. This could inadvertently encourage developers to promise restoration of habitats that are labelled low risk by the metric, when in reality these projects will have a low success rate. This highlights an issue that the risk multiplier is applied irrespective of ecological context. Context dependence, where different outcomes are observed under different conditions, is a well-documented occurrence in ecology[91]. Certain habitats are only viable when the required ecological conditions, such as soil pH, are met[92]. Therefore, attempting to create certain habitats in the wrong conditions could be extremely difficult. Conversely, the risk multipliers could act to deter developers from attempting to restore or create rare habitats which are generally perceived as high risk but in fact are well suited to the particular location they are working in.

A possible exception to this would be developers who are primarily motivated by conservation rather than financial considerations. For such developers, it is possible to register a conservation project prior to beginning any work to restore or create a habitat, obtain a baseline assessment and delay the calculation of post-intervention biodiversity until the project has been successfully established. In this context the multipliers reward developers who achieve something deemed to be difficult.

In theory the expectation that developers retain a professional ecologist should avoid the risk of unrealistically optimistic projects, although there is a challenge around the availability of trained ecologists. Even with such ecologists the deterrent effect of fixed risk multipliers remains. Given the likelihood of Local Nature Recovery Strategies promoting locally appropriate habitats, a potential solution to this issue would be to reduce the application of the risk multiplier depending on the compatibility between the specific ecological conditions of the site, as outlined by the LNRS, and the planned biodiversity gains.

Overall, while the decision to base BNG assessments on habitats is scientifically justified, the potential impact of the criteria used to establish habitat value on ‘at risk’ species needs to be monitored. The weightings reflected in the current risk multipliers combined with the limitations in the extent to which local context is considered could lead to a reduction in habitat diversity. Whether this is occurring should also be monitored at the policy level.

89 Hale, R, Blumstein, D T, Mac Nally, R, & Swearer, S E (2020). Harnessing knowledge of animal behavior to improve habitat restoration outcomes. Ecosphere, 11(4), e03104. doi:10.1002/ecs2.3104.

90 Wilsey, B (2021) Restoration in the face of changing climate: importance of persistence, priority effects, and species diversity. Restoration Ecology, 29, e13132. doi:10.1111/rec.13132.

91 Catford, J A, Wilson, J R, Pyšek, P, Hulme, P E, & Duncan, R P (2022) Addressing context dependence in ecology. Trends in Ecology & Evolution, 37(2), 158-170. doi:10.1016/j.tree.2021.09.007.

92 Natural England (2011) A review of the extent, conservation interest and management of lowland acid grassland in England (ENRR259). From Habitat management and restoration. See: https://publications.naturalengland.org.uk/publication/60050?category=129022 (accessed 4 September 2025).

3.3 Verifiability

3.3.1 The metric is subjective

It is widely recognised that using a standardised metric for BNG assessments is essential to verify gains and losses in biodiversity. However, there are some concerns around the objectivity of biodiversity assessments made using the statutory biodiversity metric. It has been found that the UKHab framework for categorising habitat types can be subjective, and ecologists are liable to categorise the same habitat parcels under different habitat types[67], potentially leading to disparate biodiversity unit calculations and risking the delivery of net gain in real-terms biodiversity.

This dependence on subjective evaluation could risk the deliberate misclassification of the type or condition of habitats to reduce costs for developers, a concern that has been flagged in legal advice to the Office for Environmental Protection on the implementation of the current Environmental Impact Assessment, Strategic Environmental Assessment, and Habitats Regulations Assessment Regimes in England and Northern Ireland[93].

The recruitment of more chartered ecologists in the UK could provide a possible solution to disparate biodiversity assessments. However, there is currently a skills gap, and an under supply of ecology expertise generally[94]. Therefore, introducing further administrative requirements, such as chartering, to the recruitment of ecologists for BNG assessments creates a risk of delays in the planning application process.

3.3.2 LPAs are not sufficiently resourced to verify gains and losses

Plans to fulfil BNG requirements must have a legal agreement in place. These are obligations to enhance or maintain a specified habitat for a minimum of 30 years. The legal agreement must either be a planning obligation between the LPA, developers and/or landowners, and is enforced under section 106 of the Town and Country Planning Act 1990, or a conservation covenant, entered into between landowners and a responsible body such as Natural England[95]. For developers operating in an LPA impacted by Nutrient Neutrality, a Habitats Regulations Assessment must be carried out to demonstrate a neutral impact of the proposed development on nutrient levels[46]. Should nutrient mitigation be required for the development, statutory credits from the Nutrient Mitigation Scheme or nutrient credits generated under a conservation covenant can be purchased by the developer.

93 Keating, R, & Leydon, E (2023) Legislation, case law and implementation of the Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA) and Habitats Regulations Assessment (HRA) regimes in England and Northern Ireland. Office for Environmental Protection. See: https://www.theoep.org.uk/sites/default/files/reports-files/%E2%80%98Legislation%2C%20Case%20Law%20and%20Implementation%20of%20the%20Environmental%20Impact%20Assessment%20%28EIA%29%2C%20Strategic%20Environmental%20Assessment%20%28SEA%29%20and%20Habitats%20Reg.pdf (accessed 4 September 2025).

94 Chartered Institute of Ecology and Environmental Management (2022) Briefing document on the current capacity crisis and the need to provide supports to the professional ecological sector. See: https://cieem.net/resource/cieem-briefing-current-capacity-crisis-and-the-need-to-provide-support-to-the-professional-ecological-sector-in-ireland/ (accessed 4 September 2025).

95 Department for Environment, Food and Rural Affairs (2023) Enter a legal agreement for biodiversity net gain. HM Government See: https://www.gov.uk/guidance/legal-agreements-to-secure-your-biodiversity-net-gain (accessed 4 September 2025).

For legal agreements entered into with an LPA, there are concerns that LPAs are not sufficiently resourced to manage their new responsibilities as part of BNG. A total of £20.89 million has been committed to LPAs to assist with the transition to BNG[96], equating to approximately £62,000 per LPA (£20.89 million/ 337 local authorities). This money, in addition to private finance raised through section 106 agreement application fees, is expected to enable LPAs to fulfil their responsibilities to process applications, monitor and enforce BNG. LPAs are also expected to produce LNRSs by March 2025[97]. Yet, in 2022 just 4% of LPAs reported being adequately resourced to implement BNG, with 50% claiming that two additional full-time members of staff would be required to fulfil their responsibilities[98]. At the time of writing, 25% of LPAs have no access to ecology expertise.

Overall, it seems unlikely that LPAs are sufficiently resourced to verify gains and losses under BNG. As a result of this under resourcing, LPAs are reliant on the ecologists employed by developers to carry out baseline condition assessments, which leads to a risk that subjective decisions are made in the developer's favour. For post-implementation monitoring, which is the responsibility of equally under-resourced enforcement officers, LPAs may be limited to reliance on the voluntary sector or members of the public to report planning violations, leading to a risk that violations go unnoticed.

For conservation covenants, it is possible that responsible bodies are better resourced to fulfil their enforcement obligations. However, at the time of writing there are insufficient use cases to draw conclusions[99].

3.4 Inclusion and equity

Inclusion in the context of project planning typically means those affected by a project have the opportunity to influence planning and delivery. For BNG, this uses the same mechanisms for public accountability as the rest of the planning application ie developers must publish information about how they propose to achieve BNG as part of their application for outline planning consent.

Similarly, equity tries to ensure a fair distribution of harms and benefits. The effect of the spatial multiplier to encourage offsets within a development or within the same planning authority as the development should increase the likelihood that a community affected by a development benefits from local offsets. However, as argued in section 3.1.2, the emphasis on local offsets reduces the opportunity to ensure offset projects are consistent with strategic plans and increases the likelihood that the benefits for nature are undermined by human disturbance.

96 Department for Environment, Food and Rural Affairs (2023) Consultation on biodiversity net gain regulations and implementation: Government response and summary of responses. See: https://www.gov.uk/government/consultations/consultation-on-biodiversity-net-gain-regulations-and-implementation (accessed 4 September 2025).

97 Department for Environment, Food and Rural Affairs (2023) What local nature recovery strategies are and why they are needed. HM Government. See: https://www.gov.uk/government/publications/local-nature-recovery-strategies/local-nature-recovery-strategies (accessed 4 September 2025).

98 Snell, L and Oxford, M (2022) Survey of LPAs Ability to Deliver Biodiversity Net Gain in England. Do LPAs currently have the necessary expertise and capacity? Association of Directors, Environment, Planning & Transport (ADEPT), The Association of Local Government Ecologists (ALGE), Department of Environment, Food and Rural Affairs. See: https://cieem.net/survey-of-local-authorities-highlights-lack-of-capacity-to-deliver-biodiversity-net-gain/ (accessed 4 September 2025).

99 Natural England, Simpson, P, Pinault, G, & Short, D (2024) Securing off-site biodiversity net gain: Expert legal perspectives. See: https://naturalengland.blog.gov.uk/2024/03/04/securing-off-site-biodiversity-net-gain-expert-legal-perspectives/ (accessed 4 September 2025).

3.5 Implementation of the mitigation hierarchy

The mitigation hierarchy (as discussed in section 1.1) was incorporated into the planning framework prior to the introduction of BNG. Paragraph 186(a) of the National Planning Policy Framework states that a planning application should be refused if significant harm to biodiversity resulting from the development cannot be avoided (eg by using an alternative site), adequately mitigated, or, as a last resort, compensated for. BNG therefore contributes to the implementation of the mitigation hierarchy. Furthermore, the BNG framework has been designed to prioritise habitat restoration or enhancement over creation, which is not only in keeping with the mitigation hierarchy but has also been shown to have higher success rates[100].

3.6 Some biodiversity cannot be offset

The BNG policy acknowledges that some habitats are 'irreplaceable'[101]. These are specific habitat types that are designated either too ecologically valuable or difficult to restore to be offset eg ancient woodland, blanket bog or limestone pavements. BNG is not applicable for development projects which impact irreplaceable habitats. Instead, "bespoke mitigation plans" are required. LPAs are responsible for approving bespoke mitigation plans.

However, the lack of ecology expertise in LPAs could mean that irreplaceable habitats are protected less stringently than those covered by BNG, particularly when there is a perceived trade-off between economic prosperity and the value of biodiversity.

Moreover, there are some ecologically valuable habitats that are likely to be extremely difficult to regenerate that are not currently classified as 'irreplaceable'. One such is open mosaic habitats[102], another is ancient grassland[103].

3.7 Transparency and public disclosure

Offsetting activities need to be transparent for developers to be held to account and the goals of nature offsetting schemes to be achieved (section 1.1). Publicly available registries are online databases that contain records of offsetting activities, enabling scrutiny of these activities, fostering transparency and accountability. There are several public registries to record offsetting activities in England and the UK. For example, the UK Land and Carbon Registry holds details of Woodland Carbon Code and Peatland Carbon Code projects, and the Biodiversity Gains Sites Register holds information for off-site offsetting activities for BNG. For Nutrient Neutrality, a registry has not been implemented.

100 Theis, S, Ruppert, J L, Roberts, K N, Minns, C K, Koops, M, & Poesch, M S (2020) Compliance with and ecosystem function of biodiversity offsets in North American and European freshwaters. Conservation Biology, 34(1), 41-53.

101 Department for Environment, Food and Rural Affairs (2024) Irreplaceable habitats guidance. See: https://www.gov.uk/guidance/irreplaceable-habitats (accessed 4 September 2025).

102 JNCC (2011) UK Biodiversity Action Plan Priority Habitat Descriptions: Open Mosaic Habitats on Previously Developed Land.

103 British Ecological Society (2024) Discussion paper on Ancient Grasslands. See: https://www.plantlife.org.uk/wp-content/uploads/2024/11/FINAL-discussion-paper-on-ancient-grassland_with-consultee-list-and-minor-revisions.pdf (accessed 4 September 2025).

Notably, there is no requirement for offsetting activities that occur on the site of development to be logged on a public register. Instead, information for on-site activities should be made available by the relevant LPA, potentially reducing data accessibility and making BNG outcomes difficult to track. This is particularly concerning considering the predicted high rates of on-site projects[104]. Further, equivalent gains and losses of biodiversity are unreferenced in the Biodiversity Gains Sites Register, making it difficult for anyone scrutinising the register to attribute specific offsetting activities to the corresponding destruction of biodiversity. This lack of specificity may reduce accountability for offsetting activities, such as making it difficult to detect instances of double counting, whereby the same conservation action is used more than once to fulfil BNG requirements. Additionally, the registry does not include spatial files, which limits the extent to which analysis can be carried out to monitor the schemes' performance.

There is also an absence of communication between existing registries, and other useful databases such as protected areas, conservation, and land use plans[105]. This lack of crosstalk could enable double counting between agricultural-environmental schemes and different nature offset markets, whereby the same conservation actions can be used to generate credits under multiple schemes. Implementing integrations that facilitate crosstalk between LPA records, private marketplaces, and various registries could greatly enhance accountability of nature offset markets.

3.8 Additionality and stacking

Additionality refers to the provision of real, measurable and additional conservation benefits that would not have been achieved without intervention[23 – 27]. Stacking is defined by the government as the process of selling multiple credits or units from different nature markets for the same activity on a piece of land[36]. The stacking of credits from different offset markets has the potential to promote multifunctional land use[106]. This is because landowners are incentivised to deliver multiple ecosystem services using a single parcel of land. Multifunctionality in this context is beneficial as ecosystem services are interconnected[105]. For example, the afforestation of grassland can lead to both carbon sequestration, mitigating the impacts of climate change, but also improved water retention and quality[103] and biodiversity[104].

However, stacking can also give rise to additionality issues. In some cases, fulfilment of one offsetting criterion will automatically enable fulfilment of another. For example, planting trees will simultaneously offset carbon dioxide and biodiversity. Yet, the gains for biodiversity in this instance would have been realised regardless of the imposed offsetting rules. Therefore, enabling a single action to be used to fulfil multiple offsetting requirements could mean that some nature-destroying activities go uncompensated.

104 zu Ermgassen, S O, Marsh, S, Ryland, K, Church, E, Marsh, R, & Bull, J W (2021) Exploring the ecological outcomes of mandatory biodiversity net gain using evidence from early-adopter jurisdictions in England. Conservation Letters, 14(6), e12820. doi: 10.1111/conl.12820.

105 Kujala, H, Maron, M, Kennedy, C M, Evans, M C, Bull, J W, Wintle, B A, … & Gordon, A (2022) Credible biodiversity offsetting needs public national registers to confirm no net loss. One Earth, 5(6), 650-662. doi: 10.1016/j.oneear.2022.05.011.

106 The Royal Society (2023) Multifunctional landscapes: Informing a long-term vision for managing the UK's land (DES7483). See: https://royalsociety.org/news-resources/projects/living-landscapes/multifunctional-land-use/ (accessed 4 September 2025).

There is also a risk of antagonistic interactions between different nature offset markets. For example, it has been established that areas with high levels of nitrogen pollution do not facilitate plant-rich habitats[107]. Therefore, it may be difficult to make biodiversity gains at relevant sites for Nutrient Neutrality because nutrient pollution levels are likely to be elevated, at least at the beginning of the project. Despite this, the current rules for the BNG and Nutrient Neutrality markets allow the sale of stacked credits. It will therefore be important to monitor the outcomes of any such projects to see whether they do indeed deliver against the requirements of both markets.

3.9 Long-term outcomes and permanence

BNG contracts are required to be in place for 30 years. Section 1.1 highlights that biodiversity gains should be delivered in perpetuity. For this reason some argue that 30 years may not be a sufficient time commitment[108]. It should also be noted that some habitats in the framework can take 30+ years to mature, hence the temporal multipliers discourage attempts to create habitats with longer establishment requirements. It is possible for land-owners to take out subsequent contracts on the same habitat with commitments to further improve the quality, in which case an extra 30 years will be added to however much time is left on the original contract.

In the absence of such contractual protection, the only additional safeguard against the destruction of that habitat through development after 30 years is its increased habitat value, as assessed by the statutory biodiversity metric, making it significantly more expensive to offset. This of course assumes that the BNG framework is still in place in 30 years. It remains to be seen how effective a safeguard this will prove to be.

3.10 Aim to achieve no net loss and preferably, net gain

Given the discussions above that the BNG framework might not protect against reductions in the size, connectivity or variety of habitats, as well as specific concerns around the extent to which habitat valuations using the statutory biodiversity metric correlate with insect populations and priority species, there is a risk that mitigations do not deliver a net gain. This risk is compounded by the concerns around the resources available for verifying baseline habitat type and condition assessments and monitoring and enforcement of BNG contracts.

107 Accatino, F, Creed, I F, & Weber, M (2018) Landscape consequences of aggregation rules for functional equivalence in compensatory mitigation programs. Conservation Biology, 32(3), 694-705. doi:10.1111/cobi.13084.

108 Trémolet, S, Dickie, I, Treweek, J, Reisch, T (2021) Biodiversity Net Gain in England: Developing Effective Market Mechanisms. A Discussion Paper. London, United Kingdom: The Nature Conservancy. See: https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_BiodiversityNetGain_England.pdf (accessed 4 September 2025).

Conclusions and recommendations

Both Biodiversity Net Gain and Nutrient Neutrality are important initiatives for securing greater private sector investment in nature conservation and restoration. The implementation of Nutrient Neutrality is simpler thanks to its focus on quantifying the addition or removal of specific nutrients from specific catchments, although there is limited evidence to quantify the impact of mitigation measures. By contrast BNG has the harder task of trying to make biodiversity fungible through the assessment of habitat value.

Whilst the principle of using habitats as the basis for valuation is consistent with conservation science, the way the statutory biodiversity metric currently assesses habitat value overlooks crucial determinants of a habitat's capacity to support diversity at the genetic and species levels, particularly connectivity. Similarly, the application of universal difficulty multipliers fails to take sufficient account of the importance of context for determining the likely success of particular habitat creation or restoration initiatives.

A possible solution to both of these challenges would be to prioritise development of Local Nature Recovery Strategies and increase the weight given to these strategies in the statutory biodiversity metric.

The statutory biodiversity metric rightly seeks a balance between the interests of multiple stakeholders including developers, Local Planning Authorities, landowners, and communities affected by development. However, there is evidence that the balance reflected in the current set of multipliers does not sufficiently prioritise ecological objectives. As a result, some habitats are vulnerable to being lost without replacement, and some replacement habitats will not be as ecologically valuable as they could be. To address this, as well as the concern that the current approach to assessing habitat value disadvantages some species, the outcomes delivered by the current approach to habitat valuation should be monitored for whether they result in a significant reduction in habitat size and variety and contribute to any declines in 'at risk' species.

Nature offsetting markets are emerging rapidly and there is little clarity on how different nature offsetting markets, agri-environmental schemes and other innovative sources of funding for conservation will interact. To enable both greater accountability for project developers and research into the effectiveness of these interactions, it is important to develop more robust registries.

Finally, given the role local planning authorities are expected to play in approving and monitoring BNG commitments, it is important to increase the ecological expertise available to LPAs.

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The members of the Review Group involved in producing this policy briefing are listed below. The Review Group members acted in an individual and not organisational capacity. No conflict of interest was declared for this report. Members contributed on the basis of their own expertise and good judgement.

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