

Delivering Biodiversity & Environmental Net Gain

Summary Note (May 2024)

The problem

Due to housing shortages and an increasing population, 300,000 new homes will need to be built in England each year. Despite efforts to avoid using new land, space constraints mean that about half of the new homes will be built on sites that have not yet been developed, mostly farmland, at the edges of existing residential areas. New housing development on farmland will lead to a loss of natural environment and the wildlife species that live in these fields.

The solutions

The **Mitigation Hierarchy** (Figure 1¹) is to be followed throughout the development project's life cycle which prioritises the avoidance of negative impacts on biodiversity, then minimisation, then on-site habitat restoration and finally offsetting (offset, off-site compensation for residual impacts). The Net Gain must be secured for at least 30 years via obligations or a conservation covenant.²

Biodiversity Net Gain (BNG) is a new approach to development that aims to leave the natural environment in a measurably better state than it was beforehand. Under the Environment Act 2021, legislation will come into effect (end of 2023) requiring developers to deliver BNG by minimising damage to the natural environment from building works, restoring any nature lost due to the development, and delivering an overall increase in the natural environment and wildlife species. This increase will be delivered through a minimum 10% gain in Biodiversity Metric units which calculate:

*"losses and gains for terrestrial and/or intertidal habitats associated with a development or other project."*³

Environmental Net Gain (ENG) is a broader concept than BNG. First set out in the Government's 25 Year Environment Plan, it expands upon BNG approaches to include *"wider natural capital benefits, such as flood protection, recreation and improved water and air quality."*⁴ Adopting an ENG approach would enable local planning authorities to target the environmental enhancements most needed in their areas and give developers more flexibility to provide them.

Offsetting can be more likely for greenfield development sites, where environmental impact cannot be mitigated for on the site itself. It can also deliver broader environmental and social values.

*"It can allow the benefits from small developments to be aggregated around a larger restoration project with greater ecological connectivity and environmental benefits that would not otherwise be viable (...) result in environmental improvement happening closer to the communities who might benefit most from it and giving communities greater access to the natural environment."*⁵

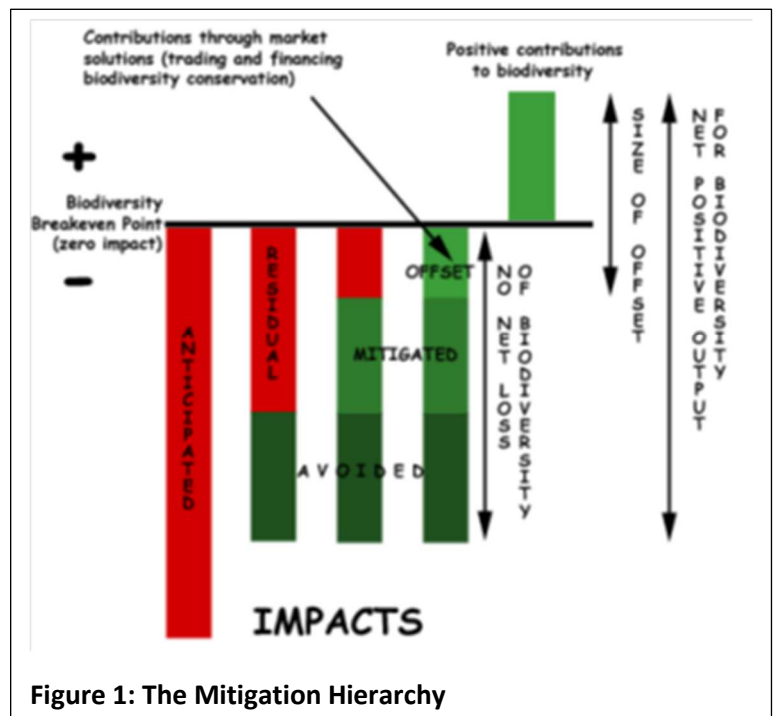


Figure 1: The Mitigation Hierarchy

¹ Houses of Parliament. Parliamentary Offices of Science and Technology. Biodiversity Offsetting. PostNote No. 369 Jan 2011. https://www.parliament.uk/globalassets/documents/post/postpn_369-biodiversity-offsetting.pdf

² Biodiversity Net Gain. RPS Group. <https://www.rpsgroup.com/services/environment/ecology/expertise/biodiversity-net-gain/>

³ Planning Advisory Service. Biodiversity Metric 3 Training for Planner. 2021. <https://www.local.gov.uk/pas/find-event/pas-past-events/biodiversity-metric-3-training-planners>

⁴ Defra (Department for Environment, Food and Rural Affairs). 2018a. A Green Future: Our 25 Year Plan to Improve the Environment. p33. <https://www.gov.uk/government/publications/25-year-environment-plan>

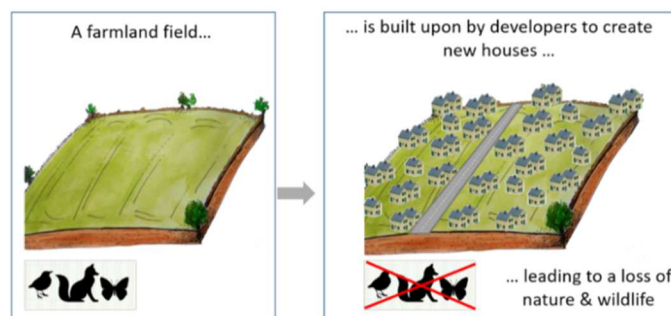
⁵ Environment Innovation Business. 2019. Delivering environmental net gain: an EIC position paper. p7. <https://eic-uk.co.uk/media/eebhjdb3/delivering-environmental-net-gain-2019.pdf>

Experiment and survey

Using a choice-based experiment and stratified survey of the general public, **we explored a range of social preferences⁶ and trade-offs between different BNG and ENG ‘offset’ Net Gain scenarios that could be delivered in response to new houses being built on greenfield sites, in this case farmland.**

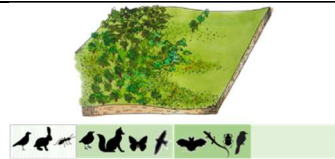
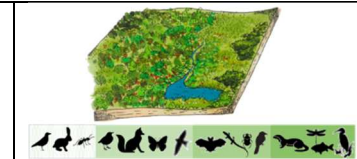
The findings are intended to **support Local Planning Authorities and other organisations** developing BNG and ENG guidance, and with a practical interest in considering how to implement BNG and ENG.

Over 4,400 people completed the experiment. Their responses provided a representative sample of the English population in terms of age, gender, regional location and by socio-economic group.



The experiment explored a range of Net Gain characteristics and social value issues including: (1) the extent of Net Gain delivered, ranging from the Minimum Legal Requirement to Moderate and High Biodiversity Enhancement scenarios; (2) whether recreational access is permitted at the Net Gain site; (3) proximity of respondent to both the housing development and Net Gain site (which may differ considerably in offset scenarios); and (4) neighbourhood wealth in the proximity of the housing development and at the Net Gain site.

Table 1: BNG and ENG scheme attributes explored in survey

Level of Net Gain (Biodiversity Enhancement) delivered	 Minimum Legal Requirement (i.e. 10% BNG)	 Moderate Enhancement of natural environment and wildlife (ENG scenario 1)	 High Enhancement of natural environment and wildlife (ENG scenario 2)
Recreational access at the Net Gain site	 Public access	 No public access	
Proximity of respondent - to housing development - and Net Gain site	1, 2, 5, 10, 25, 50, 75, 100 miles A respondent's proximity to the housing development was fixed (at either 2 or 50 miles) and they were then asked to consider Net Gain schemes at differing distances.		
Neighbourhood wealth - at housing development - at Net Gain site	 Low wealth neighbourhood  Average wealth neighbourhood  High wealth neighbourhood The neighbourhood wealth of the housing development was fixed for each respondent and they were asked to consider Net Gain schemes in areas of differing neighbourhood wealth.		

⁶ Social preferences are one type of preference investigated in behavioural economics and relate to the concepts of reciprocity, altruism, inequity aversion, and fairness. Fehr, E. and Fischbacher, U., 2002. Why social preferences matter—the impact of non-selfish motives on competition, cooperation and incentives. *The economic journal*, 112(478), pp.C1-C33. <https://doi.org/10.1111/1468-0297.00027>

The experiment also considered a range of other practical and technical issues including:

- ❖ **Cost attribute** – in reality the cost of delivering a Moderate or High Enhancement ENG would be additional to costs already being paid for by developers (or being passed on to new home owners) to deliver the Minimum Legal Requirement BNG (10% gain).

The choice experiment therefore asked respondents to choose between a number of BNG and ENG scenarios with differing costs, which were drawn from a fixed range⁷ (including zero cost, for BNG scenarios). For each scenario they were asked to choose between a ‘package of attributes’ (drawn from controlled variations set out in Table 1). An associated delivery cost greater than zero (>£0) was included for the ENG scenarios, in the form of a ‘new’ household tax.⁸

Inclusion of a cost attribute forces respondents to think carefully about how they ‘value’ the differing ‘packages of attributes’ offered under each scenario. It can also be used to elicit and quantitatively rank social preferences between groups of respondents via statistical analysis.

- ❖ **Scaling issues** – different groups of respondents were asked about differing scales of housing development. Some groups were first asked to make choices about Net Gain schemes in response to a development of 100 new houses, and then about 2000 new homes, and other groups were asked the other way round.

In addition to control questions, a series of more **traditional survey questions** were also asked to support and contextualise the analysis of the choice-based experiment responses about the following issues:

- Confidence in being able to make choices, and beliefs in respect of the framing of the survey.
- Where relevant, rationale for choosing ‘packages of attributes’ based on the developer’s Minimum Legal Requirement for Net Gain (i.e. those with zero additional cost to respondents’ households).
- Where relevant, rationale for not always considering costs each time a choice.
- Risks and concerns about the practical implementation of Net Gain projects.
- Attitudes towards housing development in general.
- Additional information about respondents, e.g. membership of environmental or conservation organisations, time spent in nature for leisure, no. of people in household, whether they have children or grandchildren, home ownership/rental status, size and type, education, household income, perception of wealth status, self-description of where they live (i.e. rural, village, small town, large/medium-sized town, city).
- Postcode information to extend analysis of results and links with areas where future housing development is expected.

Key research questions

We set the following key research questions for our preliminary analysis of the data set:

1. *Should the same communities who lose environmental quality, also be the beneficiaries of the environmental improvement delivered via Net Gain?*
2. *If the people who lose nature should not necessarily be the beneficiaries of Net Gain, who should benefit from the environmental improvements?*
3. *Are preferences for the distribution of environmental benefits sensitive to the socioeconomic background of the respondent?*

⁷ The cost attribute variable was set at [£0, £2, £4, £8, £16, £32, £64 and £96].

⁸ The choice experiment explained to respondents: “The delivery of any additional change or improvement beyond the Minimum Legal Requirement would have to be funded by taxpaying households in England via a new tax, starting this year and spread over 5 years. This new tax would cover the initial Net Gain project investments plus ongoing costs needed to maintain the Net Gain site for 30 years. The tax would be collected and managed by a Net Gain Trust consisting of scientists, members of government agencies, farmer and land owner organisations, nature conservation and community representatives.”

Results

General analysis of the data set found that:

- Respondents generally dislike policy options that cost them money, however, on average, respondents displayed preferences to move away from the Minimum Legal Requirement Biodiversity Net Gain options (i.e. the 10% net biodiversity gain).
- Preferences and Willingness To Pay (WTP) tended to increase with the level of biodiversity improvement offered (i.e. 'moderate' and 'high' biodiversity enhancements were preferred over minimum legal 10% gain option), but at decreasing rates reflecting sensitivity to the scope of environmental change and diminishing marginal utility.
- Respondents display higher preferences for Net Gain policies that deliver biodiversity improvements which are also accessible to people for recreational purposes.
- WTP gradually declines as environmental improvements are moved further away from the respondent, reflecting distance-decay effects.

Analysis relating to our key research questions focusing on the wealth type of the population benefitting from the environmental improvements found that:

- People are open to the idea of Net Gain being delivered off-site (i.e. not on the housing development site).
- Respondents do not necessarily prefer that biodiversity enhancements must benefit communities living closest to the new housing development.
- Respondents are willing to pay more for Net Gain policies delivering biodiversity improvements to low or average (as opposed to high) wealth communities.
- This is especially the case where the communities benefiting from the Net Gain are high wealth and located far from the respondent.
- These findings highlight the potential role of Net Gain (and other environmental policies) as tools to reduce social inequalities.

These results are described in detail in this published academic journal paper:

Faccioli, M., Tingley, D. Mancini, M. and Ian J. Bateman. Who should benefit from environmental policies? Social preferences and non-market values for the distribution of environmental improvements. *American Journal of Agricultural Economics* (DOI: <https://doi.org/10.1111/ajae.12467>)

Next steps (Jun-Sep 2024)

We now move into the **second phase of this project** which is focused on informing and influencing policies, strategies, and debate around the practical implementation of net gain, to increase biodiversity, equity and social benefit. We would like to develop:

- **Improved awareness and debate amongst communities, policymakers and relevant organisations to inform active and potential decision-making and strategies around delivering Environmental Net Gain.**

To be delivered through: (1) advisory and stakeholder group meetings; (2) community and environmental groups; to raise the profile of issues and stimulate debate.

- **Improved dissemination of findings and analysis and engagement activities among general public and community audiences.**

To be delivered through: (1) development of policy brief; (2) use of creative forms of dissemination through illustration/animation for general public/community audiences.

o **Key contact:** [Dr Diana Tingley](#), Senior Impact Fellow, University of Exeter d.m.tingley@exeter.ac.uk

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