Definitions and current practice

What is net gain?

Net gain is an approach to development that aims to leave the natural environment in a measurably better state than beforehand. This means protecting existing habitats and ensuring that lost or degraded environmental features are compensated for by restoring or creating environmental features that are of greater value to wildlife and people. It does not change the fact that losses should be avoided where possible, a key part of adhering to a core environmental planning principle called the mitigation hierarchy[8]. Net gain is not a new concept. Several countries around the world have already adopted biodiversity net gain policies[9] and net gain for biodiversity is already supported through national planning policy[10].

Many developers and local planning authorities (LPAs) already provide environmental improvements through well-designed development, but do not measure losses and gains and so do not make claims of biodiversity or environmental net gain. Some developers are going further to measure and ensure that each development enhances biodiversity. Mandating biodiversity net gain could provide the incentive and consistency in approach for other developers to deliver gains for the natural environment, improving wildlife habitats in quality or extent.

Biodiversity net gain

Development that adopts a biodiversity net gain approach seeks to make its impact on the environment positive, delivering improvements through habitat creation or enhancement after avoiding or mitigating harm as far as possible. Based on a standardised approach, biodiversity net gain delivers measurable improvements by comparing habitat losses and gains and steering mitigation and compensation accordingly. New or enhanced habitats can help deliver local and national biodiversity priorities such as the Nature Recovery Network and local strategies for nature, including green infrastructure strategies.

[8] The mitigation hierarchy is supported in the NPPF and described in “Policy proposals and questions” and in the glossary.

[9] International habitat compensation schemes include the Wetlands Compensatory Mitigation and Conservation Banks in the United States and BioBanking in New South Wales, Australia.

[10] NPPF paragraph 170 states that planning policies and decisions should minimise impacts on and provide net gains for biodiversity; paragraph 174 requires plans to pursue opportunities for securing measurable net gains; paragraph 175 requires planning decisions to encourage biodiversity improvements in and around developments and paragraph 118 states that the planning system should take opportunities to secure net environmental gains.

True measures of biodiversity, a term meaning the diversity of life, are complex and no single metric or number can summarise biodiversity's many qualities, benefits and characteristics. Established biodiversity net gain approaches use habitats as a proxy for biodiversity in a given area; this approach recognises that a mixture of connected high-quality habitats will support a wide range of plants, animals, fungi and microorganisms. Using habitats as a proxy measure, together with appropriate ecological advice, makes it more practical for LPAs and developers to agree on the biodiversity losses or gains due to a development.

The origin of biodiversity net gain approaches, and lessons from biodiversity offsetting

Government has previously considered how losses of nature through development can be stopped and habitats enhanced. Defra ran six 'biodiversity offsetting pilots' between 2012 and 2014. The pilots contributed to our understanding of biodiversity measurement and policy. Elements of the pilots' actions are ongoing, including biodiversity net gain policies implemented in areas such as Warwickshire, Coventry and Solihull. The pilots' evaluation, however, found that a voluntary approach was not sufficient to deliver net environmental benefits or a level playing field for developers. We have also listened to concerns that delivering genuine environmental benefits cannot be achieved if the easiest or cheapest option is for development to pay its way out of any obligations, meaning that the mitigation hierarchy is undermined.

The Defra metric

A metric helps to measure biodiversity losses and gains in a more transparent and verifiable way and provides a common reference point for agreement between a developer and an LPA. In 2012 Defra and Natural England developed a biodiversity metric to support the biodiversity offsetting pilots. The project looked at how the creation of new habitat could be used to compensate for developments with a negative overall impact on biodiversity. The metric enables practitioners to calculate the losses and gains by assessing habitat:

- Distinctiveness: whether the habitat is of high, medium or low value to wildlife.
- Condition: whether the habitat is a good example of its type.
- Extent: the area, in hectares or kilometres (depending on habitat types), that the habitat occupies.

The information needed to populate the metric should be included in ecological assessments before development[11] and for the habitats proposed after development. The

[11] An extended Phase 1 survey is the initial 'walk over' by a professional ecologist, mapping key habitats and features and checking whether protected species may be present. This is usually sufficient best practice to ensure planning policy and legal biodiversity requirements are assessed as early as possible in the development process. It is used to inform the need for further more detailed surveys, including for protected species.

metric translates some of this information into biodiversity units. To achieve net gain, a development must have a higher biodiversity unit score after development than before development.

This original Defra metric has been adopted and adapted by a range of planning authorities and developers to help to calculate biodiversity losses and gains. Natural England are updating the Defra metric in collaboration with the Environment Agency and a wide range of external stakeholders (see the box below, "Defra Metric 2.0" for details).

No metric will be able to take every detail and characteristic of biodiversity into account or deliver guarantees that all wildlife species will benefit; for this reason, individual wildlife species are not directly accounted for in the core biodiversity metric.

The value of habitats to legally protected species is measured in other ways, largely through appropriate qualitative assessment, though more objective approaches are emerging such as those being developed for great crested newts. It is anticipated that the quality and robustness of such tools will improve as they evolve.

Defra Metric 2.0

The Defra metric 2.0 will be a freely available update to the current Defra biodiversity metric that Natural England will be testing with stakeholders alongside this consultation[12]. Designed to address some of the known shortcomings with the original metric, the updated version will incorporate a number of new features, and a downloadable tool will simplify the calculation process by automating the metric calculations. It will allow for on-site biodiversity net gain calculations as well as calculations to determine the contribution of compensatory habitat off site.

Defra metric 2.0 will continue to be habitat focussed and retain the same core approach to calculating biodiversity unit value as the original metric. It will now, however, flexibly incorporate green infrastructure features (such as green roofs and street trees) and rivers into the metric and allow for greater sensitivity of habitat condition and distinctiveness scoring. It will also include measures to take better account of spatial factors, including an updated ecological connectivity component.

Defra metric 2.0 will provide consistency in habitat classification across local authority boundaries. Users will be able to copy and paste GIS[13] data, where available, directly into the tool. We will consider whether, in the longer term, we might want to bring the metric into a web-based portal to make its use even simpler for users and planning authorities.

[12] http://publications.naturalengland.org.uk/publication/6020204538888192

[13] Geographic Information Systems allow sites and habitats to be mapped digitally, providing greater accuracy and a more transparent means of showing where important habitats are on a site. They can also help to greatly speed up the process of surveying on large or complex sites.

Environmental net gain

At this stage, government is only considering mandatory implementation of net gain for biodiversity, but our longer term commitment is to embed wider environmental net gain principles in development. Our approach would be determined following evaluation of the impacts and lessons learned from the implementation of any biodiversity net gain policy, making sure that the government's overall approach supports the environment, development and the planning system.

Biodiversity net gain would increase the quality and amount of habitat for wildlife that is delivered through development, but we want to go further and explore how we can develop approaches which also take account of benefits from, and impacts on, natural capital (see Figure 2). A development that enhances biodiversity and these wider aspects could be considered to be delivering environmental net gains.

Figure 2 – The potential for environmental net gain in development. The distinctions made in this table are not clear cut in theoretical or academic terms, but are helpful to illustrate the potential scope for environmental net gains in development. Examples of what might be measured in practice are likely to vary for marine development, and for non-development application of net gain (neither of which are within the scope of this consultation).

<table>
<tr><th colspan="3"></th><th>Examples of what might be measured in practice</th></tr>
<tr><td rowspan="15">Environmental</td><td rowspan="9">Natural capital stocks: natural assets, including biodiversity assets such as terrestrial and aquatic habitats or species diversity which underpin the assets' capacity to deliver ecosystem services.</td><td rowspan="2">Biodiversity: habitats and the wildlife species they support.</td><td>Wildlife habitats (as measured by the Defra biodiversity metric)</td></tr>
<tr><td>Protected species' habitats / populations</td></tr>
<tr><td rowspan="7">Ecosystem services: the capacity of habitats, and the wildlife they support, to provide wider ecosystem and cultural services.</td><td>Water quality regulation</td></tr>
<tr><td>Air quality regulation</td></tr>
<tr><td>Places for recreation</td></tr>
<tr><td>Carbon storage and sequestration</td></tr>
<tr><td>Flood water regulation</td></tr>
<tr><td>Wildlife for enjoyment and appreciation</td></tr>
<tr><td rowspan="6" colspan="2">Natural capital pressures: direct and indirect pressures on national and international natural capital stocks.</td><td>Energy efficiency</td></tr>
<tr><td>Water efficiency</td></tr>
<tr><td>Transport efficiency</td></tr>
<tr><td>Waste and recycling efficiency</td></tr>
<tr><td>Construction materials and processes</td></tr>
<tr><td>Light and noise pollution</td></tr>
<tr><td colspan="2">Recreation impacts on protected sites</td></tr>
</table>

Net gain for biodiversity must remain the core requirement of natural capital and environmental net gain approaches – the social, environmental and economic value of natural capital is underpinned by biodiversity and these assets cannot be enhanced unless they are made resilient as part of functioning and healthy ecological networks. Simply put, the loss of biodiversity places all of the benefits we receive from nature at greater risk of decline or even collapse. This consultation therefore focusses on whether the government should introduce mandatory biodiversity net gain. However, we would also value responses that help us to gather evidence as to how wider environmental impacts could be measured and addressed in any future environmental net gain approach (also see "Ambitions for wider environmental net gain" section).

Development can affect natural capital in two broad ways:

- Direct loss or gain of natural capital: By changing the areas of various habitats we also change the benefits that this natural capital can provide for people. For example, an increase in woodland could provide benefits such as carbon capture, recreation or flood risk reduction.
- Indirect impacts on natural capital: By changing the pressures placed on natural capital by new development we also affect wider natural capital stocks. For example, a new home that is water efficient might exert a smaller pressure on rivers and other water bodies and might contribute to reducing the impact of droughts.

Both of these types of impacts should be addressed in environmental net gain approaches, but progress towards such a wide ambition needs to be made at a rate that, whilst being ambitious, minimises risks to the environment and does not inhibit the timely and cost-effective delivery of much-needed development.

The assessment of natural capital net gain, which encompasses biodiversity net gain and the enhancement of assets which deliver ecosystem services, can be complex and is an evolving science. We will continue to engage with stakeholders to address key policy questions including:

- Whether, or where, trade-offs between individual benefits from natural capital, excluding biodiversity, should be permissible (i.e. could we trade between flood risk reduction and air quality improvement?),
- whether natural capital net gain is best achieved through explicit measurement at the development level, or by more effectively taking natural capital into account in spatial planning,
- whether certain assets or benefits should be prioritised over others depending on the location (e.g. to give a higher weighting to natural flood risk mitigation measures upstream of flood risk zones),
- whether 'assets' or 'benefits from assets' should be considered in a metric (i.e. is a woodland more valuable because more people use it?), and
- how total net gains could be achieved across diverse measures of natural capital benefits (i.e. could we add units of reduced flood risk to units of air quality to calculate a net gain overall?).

Once we have a clear understanding of these complexities, we will be able to consider options for using net gain to address the remaining considerable hidden costs for communities, society and future generations that are not often accounted for, or compensated, currently. Robust assessment of natural capital net gain will require the development and improvement of data, tools and metrics. We recognise the significant social benefits that might come from explicitly targeting such improvements and are contributing to the progression of these tools and approaches. As part of this work, Defra and Natural England are developing (with academia, industry and planning authorities) a new tool called an 'eco-metric' which aims to measure the ability of habitats to deliver ecosystem services. The eco-metric is currently being tested to see how well it measures change in benefits from natural capital, and what proportion of these benefits would be delivered through the biodiversity net gain approach at its core. If successful, it will provide a freely available tool for assessing both biodiversity and broader natural capital net gains.

It is still uncertain how net gains against some of the "Natural capital pressures" (see Figure 2) aspects might be defined. For example, a net gain in water efficiency might mean an improvement on the current average water efficiency of homes, or it might mean exceeding standards or targets for new development. What this might mean for various types of commercial or industrial development is not yet clear.

Many of these components of net gains for "Natural capital pressures" are already targeted through planning policy, building regulations and government strategies. For example, the Buildings Mission sets out to halve energy usage in new buildings by 2030[14]. Through the Clean Growth Strategy, government will be working with industry to increase the amount of UK timber used in construction, locking in carbon, and encourage more businesses to support cost-effective emissions reductions, such as planting trees or making other land use changes.

In deciding how to achieve environmental net gain, it will be necessary to weigh the considerable environmental costs to society of inaction against considerations around the practicalities and any costs or delays to development. Exploring what net gain means for these measures, and how these measures might be adapted for voluntary application outside the scope of this consultation, will require further work and engagement with expert stakeholders and across government.

[14] The Industrial Strategy sets out Grand Challenges to put the UK at the forefront of the industries of the future, with missions to tackle these challenges. It is crucial that developments should be planned to reduce emissions, helping to mitigate climate change, alongside incorporating net gain of biodiversity, in line with the Climate Change Act 2008.

Biodiversity net gain in practice

Net gain in planning policy

Legislation requires public bodies to have regard to conserving biodiversity[15], and biodiversity net gain is an established part of planning policy. The National Planning Policy Framework (NPPF) has recently been revised to make clear that planning should '*identify and pursue opportunities for securing measurable net gains for biodiversity'*[16] and LPAs and developers already take biodiversity into account in planning discussions and decisions. Biodiversity is often assessed with the support of professional ecologists who provide advice throughout the planning and development process to LPAs and developers. The quality and sensitivity of habitats and species are considered when deciding if land is suitable for development, and developers avoid purchasing the least suitable sites or risk refusal of planning permission. Developers design the layout and landscaping of development to avoid significant harm and provide new habitats, as part of green infrastructure and to provide biodiversity enhancements sought by local plans. Green infrastructure can include trees, hedgerows, meadows, ponds or green roofs and green walls. Where harm cannot be avoided then mitigation or, if necessary, compensatory measures for specific biodiversity impacts are negotiated and secured through planning conditions and legal obligations.

This system works well to avoid the most severe impacts on biodiversity and protect the best sites for wildlife, but less well to manage the gradual erosion of lower value habitats. Cumulatively, even 'insignificant' losses of habitat at a development scale add up to significant rates of biodiversity loss overall. The approach also leaves much to be agreed in relatively subjective and discretionary ways – while this offers some flexibility, it can also result in uncertainty and costs for both developers and LPAs. Current practice enables some enhancement but without reliable measurement there is no way of understanding how much this benefits the environment and people.

In practice, a variety of approaches are employed by the 353 local authorities in England which developers must navigate and adapt to. For example, some LPAs have adopted existing metrics to achieve biodiversity net gain, whereas others rely on local plans identifying habitat features or sites for conservation. Both developers and LPAs rely on professional advice and ecological data which can vary in quality, presentation and cost. Consequently, it can prove challenging to reach an agreed position around a qualitative technical ecological report; ultimately, both developers and people who have objected to an application must rely on informed but subjective reporting and conclusions.

[15] Section 40 of the Natural Environment and Rural Communities Act 2006
[16] Paragraph 174, NPPF

Some LPAs have adopted mandatory biodiversity net gain policies (see box below). This helps to ensure that a consistent approach is applied to development and that biodiversity gain can be achieved at a development and local plan level. However, there is little consistency in policies or approaches nationally or even between adjacent LPAs. Mandatory net gain for biodiversity across England would reduce inconsistency, provide greater certainty for developers and provide a more efficient means for LPAs to implement national planning policy whilst addressing local environmental priorities.

In **Warwickshire, Coventry and Solihull** a system has been implemented to ensure that development leads to no net loss of biodiversity, facilitated by Warwickshire County Council.

Biodiversity impact assessments are required for all developments, providing evidence of the application of the mitigation hierarchy, subsequent on site compensation, and any residual biodiversity loss triggering biodiversity offsetting. This requirement is set out in LPA policy, and within the county wide Green Infrastructure Strategy. The county has comprehensive online mapping of ecological information, which enables both planning applicants and LPA strategic planners to determine the potential ecological value of a proposed development site. This information is also used to identify ecologically rich or deficient areas and the ecological linkages present or needed to join them together at a site, regional or national scale.

Biodiversity impact assessments involve an ecological survey to assess the biodiversity value. The biodiversity impact is calculated using the Warwickshire version of the Defra metric. The metric is also used to quantify the amount of offset necessary to compensate for any residual biodiversity loss and the mapping ensures that compensation puts "*the right habitat in the right place*."

Greater Manchester has expressed an ambition to be a carbon neutral, climate resilient city-region with a thriving natural environment and circular, zero-waste economy. The Greater Manchester Combined Authority will produce a Natural Capital Investment Plan by the end of this year which will promote investment and delivery of opportunities that protect and enhance Greater Manchester's natural capital to support a healthy population and economy.

The Greater Manchester Spatial Framework is a spatial strategy for Greater Manchester. It is a new plan for jobs, homes and the environment. The framework will reflect the strategic priorities in national planning policy across Greater Manchester and provide the context for local plans, including a measurable net gain in biodiversity value through new development. Greater Manchester is developing guidance for delivering biodiversity net gain at a city-region level; this is the first step towards embedding wider net gain for people, places and nature.

Net gain approaches in industry

There is growing momentum within the development and construction industry to implement biodiversity net gain:

- Housing developers have committed to achieving biodiversity net gain, for example Barratt Homes, Berkeley Group, and Redrow Homes have all adopted biodiversity net gain approaches (see the box below about the Berkeley Group's approach);
- Infrastructure programmes are adopting a biodiversity net gain approach, including Crossrail, the East-West Rail Alliance and the Greater West Programme (note that nationally significant infrastructure projects are outside the scope of this consultation);
- Utilities and land managers, such as National Grid, Thames Water and Yorkshire Water are increasingly working towards biodiversity enhancement targets and commitments, and some are exploring means of also achieving gains in benefits from natural capital; and
- Professional and industry bodies[17] have supported the adoption of biodiversity net gain approaches through the provision of good practice principles[18] and guidance based on established international best practice[19]. Biodiversity net gain is already recognised in sustainable building standards (from BREEAM) which incorporates the Defra metric, and work is underway to incorporate biodiversity net gain into BRE Global's CEEQUAL quality assurance scheme for infrastructure. Work is underway to develop a British Standard for biodiversity net gain[20].

Berkeley Group – creating net biodiversity gain within all new developments

The Berkeley Group made a commitment in 2016 that all new developments from May 2017 will create a net biodiversity gain within the development site. Berkeley's commitment has been informed by the learning and experience they gained in delivering a number of high quality, biodiversity rich developments. For example, at their 'Kidbrooke Village' development Berkeley partnered with the London Wildlife Trust and consulted the Royal Borough of Greenwich's Biodiversity Action Plan to provide green space that engaged the local community and increased biodiversity. This work also led to increased engagement with the local community and 20 hectares of new parkland within the development, which will deliver 4,800 new homes. Berkeley Group have adapted a version of the Defra biodiversity metric to forecast biodiversity losses and gains.

[17] Construction Industry Research and Information Association, Chartered Institute of Ecological and Environmental Management, Institute of Environmental Management and Assessment supported by Balfour Beatty.
[18] Biodiversity Net Gain: Good practice principles for development 2016.
[19] As set-out by the Business and Biodiversity Offsets Programme (BBOP), http://bbop.forest-trends.org/
[20] Work to develop the new British Standard is being led by the British Standards Institute working with Natural England, Defra and a wide range of industry, NGO and land management bodies. The new standard will likely be in two parts: design and pre-construction and construction/post-construction and is anticipated to be available in 2019/2020.

Our view (that we want to test and seek evidence for via this consultation) is that the increasing but patchy use of net gain, using voluntary approaches to fully deliver on the objective of national policy, means that the market for developable land is uneven; developers that do not plan to include any habitats in or around their development can outbid those who want to deliver more. This means that the costs of habitat mitigation are borne by the developer instead of being factored into the land price at the outset to reflect the biodiversity value of the land.

Outside of local or voluntary biodiversity net gain schemes, not all development is delivering measurable improvements for biodiversity and local people, and appears to be cumulatively failing to properly address the decline in England's biodiversity. Our view is that there is an opportunity for mandatory biodiversity net gain to mainstream the best of these existing approaches. There have been a number of calls for government action to strengthen policy on the application of biodiversity net gain and through this consultation document we explore how best to put a mandatory approach into practice.

Photo: London Wildlife Trust