CIEEM

Briefing Paper

Biodiversity Enhancement for New Developments in Ireland

CIEEM Ireland Policy Group

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Introduction

In simple terms, Biodiversity Enhancement (BE) is about designing developments in a manner that leaves biodiversity in a better state than before. This is achieved by avoiding impacts on ecological features of high value, minimising unavoidable impacts, enhancing the value of existing features, and providing new ecological features that were not previously present.

A number of terms and acronyms for BE have been used to describe the process. Early approaches typically focussed on No Net Loss (NNL), which requires negative impacts on biodiversity to be offset by gains elsewhere, thereby achieving a neutral effect. However, in recent years the level of ambition has increased, aiming for a positive rather than a neutral effect.

A pioneering approach was taken in England using the 'Biodiversity Net Gain' (BNG) approach, where the Environment Act 2021 introduced a legal requirement for all new developments to achieve a 10% increase in biodiversity units. This is calculated using a metric developed by the Department for Environment, Food and Rural Affairs (DEFRA) that compares habitats before and after development. Scotland and Wales are developing similar frameworks, implemented under planning policy rather than legislation.

However, there is currently no formal legislation or policy regarding BE in the Republic of Ireland or Northern Ireland. In this Briefing Paper we make recommendations on the approach to BE that we propose for use in the Republic of Ireland and Northern Ireland. We hope that it will contribute to a broader discussion about the best approach for Ireland, and will assist policy-makers in each jurisdiction when developing national guidance.

This document has been prepared by the Ireland Policy Group of the Chartered Institute of Ecology and Environmental Management (CIEEM). CIEEM is the main professional body for ecologists in Ireland, with 530 members across the island. We are a cross-border group, so this document represents our approach both for the Republic of Ireland and Northern Ireland.

This document may be of interest to the following groups:

- Public authorities responsible for guidance and policy on BE
- Ecologists designing biodiversity enhancements for new developments
- Biodiversity Officers, Planners and other specialists reviewing BE proposals
- Developers, Architects and Planning Consultants that wish to understand the process
- Members of the public who wish to review and/or critique BE proposals

Existing Policy Regarding BE in Ireland

In the absence of national guidance, a number of public, semi-state and private organisations have started to develop policy regarding Biodiversity Enhancement. Some examples are presented below:

- The Irish National Biodiversity Action Plan (BAP) 2017-2021 includes the following action: *"All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting, etc"*. A new BAP is currently in development, and is expected to include a similar or more ambitious requirement regarding BE.
- In Northern Ireland, the Wildlife and Natural Environment Act (Northern Ireland) 2011 states that *"it is the duty of every public body, in exercising any functions, to further the conservation of biodiversity"*.
- Many county/city/local development plans now include commitments to implementing BE for new developments. For example, Policy GI16 of the Dublin City Development Plan 2022-2028 states that "Opportunities should be taken as part of new development to provide a net gain in biodiversity" and policy GINHP14 of the Fingal Development Plan 2023-2029 says *"Promote biodiversity net gain in new developments and develop a planning guidance document on Biodiversity Net Gain"*.
- Dún Laoghaire Rathdown, Fingal and Dublin City councils have included the development of Biodiversity Net Gain guidance as an action of the biodiversity plans for each county.
- The (Draft) Derry City and Strabane Local Development Plan 2032 includes the following: *"where possible, developments will be expected to include suitable measures to contribute positively to overall biodiversity net gain in the District or to mitigate harm caused by development through measures including additional and compensatory tree planting"*.
- Action 3.9 of The Office of Public Works Biodiversity Action Plan 2022-2026 is the *"Development of a suitable approach to Biodiversity Net Gain as a policy principal within flood scheme decisions"*.
- Objective 3 of Irish Water's Biodiversity Action Plan is to *"Ensure 'no net loss' of biodiversity when carrying out activities, or delivering plans or projects" and "actively seek opportunities for biodiversity net gain by identifying opportunities for biodiversity enhancement at both existing and proposed Irish Water sites"*. To measure this quantitatively, Irish Water has developed an in-house metric based on habitat extent and quality.
- Engineers Ireland produced an issues paper in 2021 titled 'Protecting Biodiversity: The role of Engineers', which noted that: *"To halt the loss of biodiversity through development, a project should leave the environment in a better state than before. Aiming for Biodiversity Net Gain should form the basis of all engineering projects."*
- SSE Renewables "*is targeting Biodiversity No Net Loss from 2023 and Biodiversity Net Gain from 2025 on newly-consented large onshore projects"*. They have published internal guidance on Biodiversity Net Gain on new onshore wind energy projects in Ireland and Scotland, which is adapted from English guidance and the Defra metric (see below). They highlight an ambition to improve biodiversity at all new sites, despite *"an absence of a recognised framework in Scotland and Ireland"*.
- The Irish Green Building Council has developed the 'Home Performance Index', which awards certificates for the standard of a home's design, construction and environmental sustainability. Category EN5 refers to Ecology, and awards points for developments that achieve slight, moderate, or significant Biodiversity Net Gain, to be determined by an independent ecologist.

Based on the examples provided above, it is apparent that BE has already arrived in Ireland. It represents current planning policy in several local authorities, and is expected to be promoted more widely in the next iterations of development plans. Many semi-state bodies have committed to NNL or BE for all of their projects. Some private companies that engage in large projects (e.g. SSE Renewables) are voluntarily committing to BE on all new projects.

CIEEM has held recent events on Biodiversity

Enhancement in Ireland, including a webinar in January 2023 and a panel discussion at the Annual Irish Conference in April 2023. Members were asked whether they had carried out a Biodiversity Enhancement/Biodiversity Net Gain assessment, and more than half of the attendees indicated that they had. Most had used the English BNG approach and the Defra metric.

In this context, there is now a clear requirement for national guidance on BE in Ireland. In the absence of such guidance, different organisations are using different approaches, including adapting methods from England. This is far from ideal, because there is no consistency in approach, nor any agreement on what would constitute a legitimate enhancement. We strongly encourage the relevant authorities in the Republic of Ireland and Northern Ireland to develop national guidance in each jurisdiction, to ensure that all methods and outcomes are comparable.

CIEEM is the largest professional body of ecologists in Ireland and Northern Ireland. As such, we wish to provide some recommendations on the approaches to be implemented in Ireland, to assist the relevant authorities when developing national guidance. This document includes the following sections:

- A review of the approaches used in England, Scotland and Wales
- Criteria for a competent ecologist
- Whether we favour a quantitative approach (a biodiversity metric), a qualitative approach (professional judgement), or a combined approach
- How to incorporate BE into other ecological assessments
- Ecological features that may be considered 'irreplaceable'
- Categories of development for which BE should be mandatory, recommended or exempt
- Feasibility of ex-situ compensation
- Timescale for implementation, and monitoring
- Key considerations for habitat enhancement
- Some suggested biodiversity enhancements for urban and suburban projects

Approaches to Biodiversity Enhancement in Britain

CIRIA-CIEEM-IEMA Guidance

CIEEM in association with Construction Industry Research and Information Association (CIRIA) and the Institute of Environmental Management and Assessment (IEMA) published '*Biodiversity Net Gain: Good Practice Principles for Development, A Practical Guide*' in 2019. It is a very comprehensive guide, and should be the first source of guidance for BE assessments. The key considerations of the guidance are summarised as follows:

- Ecologists should be engaged at the very start of the design process. They should visit the site and identify any important ecological features, so that they can be taken into account during the preliminary design phase.
- The mitigation hierarchy should always be applied sequentially. The ecologist's first approach should always be to avoid impacts on ecological features. Where this is not possible, they should mitigate/minimise negative impacts. As a last resort, impacts can be compensated elsewhere.
- Avoid losing biodiversity that cannot be offset elsewhere, e.g. designated sites, irreplaceable habitats.
- Engage stakeholders early, and involve them in scoping and implementing BE approaches.
- Interventions must be implemented and monitored in the long-term, usually 25 - 30 years.

Varying approaches in England, Scotland and Wales

The CIEEM-CIRIA-IEMA guidance applies to all of Britain and Ireland, but slight variations in national guidance have been adopted in England, Scotland and Wales. There is currently no formal guidance in the Republic of Ireland or Northern Ireland.

The English approach: Biodiversity Net Gain

Under the Environment Act 2021, the English government introduced a mandatory legal requirement that new developments must achieve a 10% net gain. The law will come into force from January 2024.

The English approach is quantitative, using the Defra Biodiversity Metric (further details are provided below) to mathematically calculate changes in the extent, distinctiveness and condition of habitats between the pre-construction and post-construction scenarios. It should be noted that this refers only to habitats, and not to any other ecological features (designated sites, protected species, invasive species, etc).

Where the 10% biodiversity net gain cannot be met within a development site, provision is made to compensate for impacts outside the development site. The Environment Act 2021 also provides a legislative basis for a register of 'biodiversity gain sites', which are managed solely for the purpose of biodiversity enhancement. The Act also creates a system of national 'biodiversity credits', which formalises the means by which developers can make financial contributions to biodiversity gain sites. However, on-site gain will always be favoured over off-site gain.

Exemptions to the 10% net gain are provided for householder applications and other small-scale developments, as well as for sites consisting only of buildings and artificial surfaces (i.e. zero baseline ecological value). With these exceptions, the 10% net gain applies to all developments, regardless of scale.

As an aside, we do not recommend the use of the term 'Biodiversity Net Gain' for BE assessments undertaken in Ireland, because the term refers specifically to the methodology used in England. To avoid confusion, we currently recommend the use of the generic term 'Biodiversity Enhancement', or the selection of a specific term/title that refers only to the Irish methodology.

The Scottish approach: Positive Effects for Biodiversity

The Scottish Government has opted to deal with BE using policy (The Fourth National Planning Framework 'Policy 3: Nature Crisis') rather than legislation. It recommends a qualitative rather than a quantitative approach, and thus does not make reference to metrics, numerical targets or biodiversity credits. Instead, ecologists use their professional judgement to determine whether or not a development will enhance a site.

In September 2023 the Scottish Government published a document titled Measuring biodiversity: research into approaches. It concluded that *"with refinement, Natural England's Biodiversity Metric 3.1 could be adapted for planning and development use, and as part of a wider set of metrics within a biodiversity framework. These refinements include the coverage of habitats, and adjustments to condition assessment and multipliers to reflect Scottish contexts."* They also committed to the development of a biodiversity metric or measurement tool in Scotland that could unite multiple related sectors: natural capital markets, planning and development, biodiversity conservation and monitoring and agriculture. However, pending the creation of the new metric/tool, all assessments should follow a qualitative approach.

Importantly, the Scottish approach provides different expectations for BE depending on the scale of the development, rather than introducing a single rule for all developments (in contrast to the English approach). Biodiversity Enhancement is required under planning policy for all *"development proposals for national, major and of EIA development or development for which an Appropriate Assessment is required"*. These developments *"should only be supported where it can be demonstrated that the proposal will conserve and enhance biodiversity, including nature networks within and adjacent to the site, so that they are in a demonstrably better state than without intervention, including through future management."*

Developments of smaller scale (referred to as 'local developments') should only be supported if they *"include appropriate measures to enhance biodiversity, in proportion to the nature and scale of development"*, but there is not an explicit requirement to demonstrate an enhancement in all cases. Individual householder developments do not have any requirements for enhancement.

The Welsh approach: Net Benefits for Biodiversity

The Welsh government has also opted to deal with BE using policy, as outlined in Section 6.4 of Planning Policy Wales: Edition 11. It states the following: *"Planning authorities must follow a step-wise approach to maintain and enhance biodiversity and build resilient ecological networks by ensuring that any adverse environmental effects are firstly avoided, then minimised, mitigated, and as a last resort compensated for; enhancement must be secured wherever possible"*. As in Scotland, the Welsh approach requires a qualitative (professional judgement) rather than a quantitative (metric) approach.

Ecologists are therefore encouraged to take a whole system approach when conducting assessments including an understanding of:

- The biodiversity value of a site
- Its ecosystem resilience, described using the DECCA approach (Diversity, Extent, Condition, Connectivity and Aspects)
- The ecosystem services or benefits provided, and
- Its existing and potential linkages with the wider green infrastructure network – before and after as a result of the development proposal.

The Welsh approach does not distinguish between different scales of development, but the inclusion of *"whenever possible"* in the policy document may provide an exemption for certain developments.

Key considerations for BE on the Island of Ireland

In this section we provide recommendations for the implementation of BE on the Island of Ireland. In general terms, we consider the CIEEM-CIRIA-IEMA Good Practice Guidance to provide the best over-arching framework for BE, and we recommend that it should be considered as the main reference text for all BE assessments. However, within this framework there are a number of key considerations, which we outline below.

Engaging a competent ecologist

Developers should ensure that ecologists are suitably-qualified to carry out a BE assessment. We consider the following qualifications and experience to be the minimum requirements for the lead ecologist on a BE assessment:

- A Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) or similar professional body, and subject to a published code of conduct
- A minimum of 3 years experience as an ecologist
- Demonstrable experience and training in any specialist surveys required (e.g. bats, birds, botany)
- A qualification in ecology or a related subject

Although aspects of BE can be designed and/or implemented by other environmental disciplines (e.g. a landscape architect, environmental consultant), the assessment must always be coordinated and reported by a competent ecologist.

The ecologist must be engaged at the start of the design process, and should carry out a baseline survey of the development site before any work commences. This will ensure that any important ecological features (e.g. irreplaceable habitats) can be identified at an early stage, and ideally avoided.

The ecologist will then provide iterative assessment over the course of the design process, culminating with a planning assessment. After planning is secured, the ecologist will often need to advise the developer during the construction process, and to monitor ecological features when the development is operational.

Measuring Changes in Biodiversity: Qualitative vs Quantitative Approach

When carrying out an ecological assessment for BE assessment, it is necessary to determine the 'importance' of ecological features. This valuation process can be complex, as it is influenced by a range of variables, such as the extent of a given ecological feature in the region, the condition of that feature at the time of survey (e.g. anthropogenic degradation), and the longer-term national trends in its conservation status. CIEEM guidance on Ecological Impact Assessment sets out a framework for ecologists to value and identify features of ecological importance. In Ireland, EPA Guidance for Environmental Impact Assessment Reports provides additional terminology based on context, character, significance and sensitivity. These are qualitative assessments based on an ecologist's professional opinion of the information available to them.

As an alternative to the qualitative approach, the UK Department for Environment, Food & Rural Affairs (DEFRA) developed a Biodiversity Metric for England, which is a habitat-based approach used to calculate an area's value. The metric assigns a score (referred to as 'biodiversity units') for each habitat based on its area, distinctiveness and condition. The ecologist must judge which category to select, but they are unable to vary the scores assigned by the metric. By comparing biodiversity units between the pre-development and post-development scenarios, the metric then determines the change in ecological value of a site.

By representing habitat features using numerical values, the metric allows a quantitative rather than a *qualitative* approach. This is necessary when applying numerical targets to BE: for example, the Environment Act 2021 requires a minimum 10% net gain (calculated using the biodiversity metric) for all new developments in England.

Other metrics have been developed in Ireland by certain organisations, usually by multiplying the area of the habitat by a weighting value based on its quality, or by the number of species present.

A quantitative approach may seem preferable to a qualitative approach, in order to reduce subjectivity of ecologists' conclusions. However, ecosystems are inherently complex, and any attempt to represent them numerically will involve a series of assumptions and simplifications, which are inevitably open to

critique. Different approaches are used in each of the British nations, some using a qualitative and others a quantitative approach.

Should we use a biodiversity metric and/or numerical target?

As discussed above, a key consideration in Biodiversity Enhancement is whether it should comprise a quantitative assessment (using a metric) or a qualitative assessment (based on professional judgement). Having considered both approaches, we recommend that BE in Ireland is based primarily on a qualitative assessment. This means that the ecologist should use their professional judgement to determine whether or not a development results in BE, rather than basing their decision on a metric or numerical target.

In general terms, we do not recommend the standardised use of a metric for the following reasons:

- The Defra metric is based only on habitats, and does not consider other ecological features such as protected species (e.g. bats, fish, rare flora), invasive species, ex-situ designated sites, etc. A development may have a positive effect on habitats and a negative effect on species, but only the former will be counted by the metric. Some protected species favour habitats of relatively low intrinsic value (e.g. built structures for roosting bats, or pre-thicket conifer plantations for Hen Harriers)
- The Defra metric has been developed for use in England, based on several years of consideration and consultation. It would need to be adapted for use in an Irish context, because it uses a different habitat classification system (the *UK Habitat Classification* scheme, which differs from the Fossitt (2000) classification scheme used in the Republic of Ireland), and because there are differences in the relative importance of some habitats between England and Ireland. The adaptation process would require research, consultation and trialling.

For similar reasons, we do not currently recommend the use of a numerical target for BE in Ireland (e.g. the requirement for a 10% BNG in England), because this could only be achieved using a biodiversity metric.

Although we favour a qualitative approach, the ecologist's decision should be evidence-based, including specialist or expertise input where required, and include facts and figures that justify their conclusion, e.g. 100m of existing non-native hedgerows will be removed, and 200m of new native hedgerow will be planted, resulting in a net gain in the quantity and quality of hedgerow habitat.

An ecologist may also adopt a 'hybrid approach' in which a metric is used to assess certain habitat features, e.g. to demonstrate that proposed habitat management measures would achieve net gain in comparison to habitats that will be removed. However, we recommend that any such calculations should be used in support of a broader qualitative assessment, and should not be the primary focus. The ecologist should also acknowledge the limitations of the metric and explain how they have been taken into account.

Finally, while we have some concerns about the adoption of a quantitative approach based on the Defra metric, but we would be open to the use of a metric that was developed specifically for an Irish context. The metric would need to incorporate Irish habitat classification schemes (notably the Fossitt scheme in the Republic of Ireland), and have 'distinctiveness' weightings that represent the relative importance of habitats in Ireland. This would need to be developed by statutory agencies in each jurisdiction, with reference to contemporary metrics in Britain.

How can BE be incorporated into other ecological assessments?

Most aspects of a BE assessment are covered in an Ecological Impact Assessment (EcIA) or Biodiversity Chapter of an Environmental Impact Assessment Report (EIAR), such as the description and valuation of baseline features, assessment of potential impacts, addressing impacts using the mitigation hierarchy, and consideration of residual impacts. The 'Residual Effects' section of an EcIA involves a review of the positive or negative impacts of a development after mitigation measures, and thus is effectively a judgement of whether a development results in a biodiversity gain or loss.

In this context, we recommend the following additions to an EcIA when considering BE:

- It should be declared clearly in the introduction of the EcIA that the aim is to achieve BE. Relevant national or local policies (e.g. County Development Plans) should be quoted. The ecologist should outline their approach to assessing BE.
- In the 'Mitigation' section of the EcIA, the ecologist should discuss all impacts using the mitigation hierarchy. In the first instance they should aim to avoid impacts, and then to

mitigate/minimise impacts. Where this is not possible, compensation is the last option. An evidence base for all avoidance, mitigation and compensation measures should be provided.

- Separate to the compensation process, an ecologist may propose measures whose only purpose is to enhance the ecological value of a site, e.g. providing bat or bird boxes, reducing frequency of mowing grassland habitats. This is different from mitigation, because it is not linked to any impacts - these measures should be described as 'Biodiversity Enhancements' and presented under a separate heading.
- In the residual impacts section, the ecologist should summarise the impacts on each Important Ecological Feature and conclude whether the impacts are negative, neutral or positive. This process should be honest and transparent so that third parties can understand the ecologists' rationale. At the end of the process the ecologist should provide an overall conclusion for the development as a whole, using significance terms (e.g. slight, moderate, significant) and geographic terms (e.g. Local, County) as appropriate.

In this context, we do not consider it necessary to prepare stand-alone BE assessments alongside an EcIA or EIAR Biodiversity chapter. Where possible it is best to include all relevant information in one document rather than producing multiple repetitive documents. However, the ecologist should use separate headings to distinguish between Biodiversity Enhancement, Ecological Impact Assessment and other relevant considerations.

Additional considerations

What habitats should be considered irreplaceable in Ireland?

Under CIEEM guidance, BE cannot be considered for certain 'irreplaceable' habitats. This is defined in Technical Note T3 of the CIEEM guidance as follows: *"Irreplaceable habitat is habitat that, once lost, cannot be recreated elsewhere, within a reasonable timeframe. Ancient woodland, active peatland and limestone pavements are widely accepted as examples of irreplaceable habitats. There is less agreement or understanding of what other irreplaceable habitats are present within the UK."*

We do not consider it necessary to provide detailed guidance on what habitats should or should not be considered irreplaceable, because this is usually context dependent. Some features may be common and widespread in one part of the country, but rare and localised in another part of the country. However, in general terms, any features of national or international importance should be considered 'irreplaceable'. This would typically include ancient woodland, active peatland, limestone pavements, freshwater springs/ wetlands, coastal habitats (mudflats, saltmarshes, dunes), and the qualifying interests of designated sites. CIEEM Guidance on Ecological Impact Assessment provides a system for the valuation of habitats at different geographical scales, which takes all relevant factors into account.

Certain habitats may be common and widespread, but may be impossible or very difficult to replace. For example, curlew may nest in semi-improved grassland, and derelict buildings can support roosts of lesser horseshoe bat. It may be possible to replace these features, e.g. through management of surrounding grassland or construction of an artificial roost. However, in some circumstances a key feature for species may be considered 'irreplaceable' in the same manner as the habitats above.

The key is that ecologists should identify potential irreplaceable habitats at an early stage in the project design, and communicate their importance to the design team. Early consultation with statutory agencies (e.g. NPWS, NIEA) is strongly advisable in these cases. The priority should always be to avoid impacts on these habitats, followed by other steps in the mitigation hierarchy. Where impacts cannot be dealt with under the mitigation hierarchy, then impacts on irreplaceable habitats cannot be offset to achieve BE.

Should it be mandatory for all developments?

Large and moderate-scale developments such as infrastructure projects, flood alleviation schemes, renewable energy (wind farms, solar arrays) and large residential developments will almost always have opportunities to achieve BE. Therefore, it would be reasonable and feasible for planning authorities to introduce a mandatory requirement for all such developments to achieve BE, as is the case in Scotland.

However, it may not always be feasible for small and moderate-scale developments to achieve BE. For example, many city-centre developments do not have any soft landscaping, which substantially limits opportunities for biodiversity enhancement (the English Biodiversity Net Gain approach has an exemption for sites consisting only of buildings and artificial surfaces). When redeveloping brownfield urban sites it may be necessary to clear large areas of ruderal vegetation, dry meadow or scrub; all of which could potentially be of local ecological importance in an urban context. It would be impossible to implement enough biodiversity enhancement measures to achieve a net gain, which would effectively make it impossible to develop the site. This may be counterproductive from an ecological perspective, as it is usually preferable to redevelop brownfield sites than to build on greenfield sites. Therefore, for small or moderate-scale developments we suggest that BE should be an expectation rather than a mandatory requirement. Pragmatic exemptions may be considered, notably where a brownfield site has been recolonised by vegetation.

However, reasonable evidence would still need to be provided when a developer requests an exemption from BE. The process should always start with an ecologist's baseline inspection of a site, and liaison with the design team regarding the mitigation hierarchy and review of potential ecological enhancements. Where the ecologist considers it impossible to achieve a BE, their case should be justified in writing (e.g. as part of an EcIA) and provided as part of a planning application.

Should ex-situ offsetting be considered?

The CIEEM guidance acknowledges that BE cannot always be achieved within a development site, in which case impacts can be offset outside the development site. This may involve purchasing additional land solely for the purposes of biodiversity enhancement, or

contributing financially to the enhancement of an area that is managed by a third-party. A formal framework for the latter has been developed in England, in which offsite lands used for BE must be registered on a biodiversity gain register and their usage linked back to a specific planning permission, measured using a standardised biodiversity metric and legally secured for at least 30 years. Some sites are managed by local authorities, and others are managed by NGOs or private companies.

In principle we support this approach, as it increases the quantity and quality of land available for biodiversity. However, this system can only operate reliably when there is a system to coordinate and account for the management of these areas, and such a system does not currently exist in Ireland. Local authorities and the National Parks and Wildlife Service are unlikely to have the resources to coordinate or manage offsetting areas. We do not propose the use of biodiversity metrics in Ireland, so there is not a clear system to calculate the amount of land required for offsetting. We also do not have the necessary systems in place to ensure that offsetting areas are managed appropriately in the long-term.

Therefore, for the Irish model of BE we do not currently consider it feasible to propose financial contributions for ex-situ offsetting. This may become feasible in the future, but it would require a framework to be put in place, e.g. the 'biodiversity gain register' used in England. The framework would need to be developed at a national level by state authorities.

At present developers may choose to purchase additional land for biodiversity enhancement that they manage themselves. However, they would need to provide clarity on the ownership of such land, on its long-term management and monitoring, and on the ecological personnel that will be involved in it. This land would need to be included in the Application Site, and management commitments would need to be provided as part of the planning application. The public authority could use planning conditions to ensure that biodiversity enhancement areas are implemented as proposed.

In certain circumstances a developer may make a financial contribution to the management of a natural area managed by a third party (e.g. an NGO). If this is the case, they would need to specify what the financial contribution would be, what it would be used for, and why it would be relevant to the ecological impacts identified in the BE assessment. However, this is a rather indirect method of compensating for ecological impacts, and would be considered an exception rather than a standard approach.

Marine environments

CIEEM's guidance on BE was developed primarily for terrestrial and freshwater environments. It was acknowledged that marine environments have many differences from terrestrial/freshwater environments, because marine habitats are often highly dynamic, and marine fauna are highly mobile. Therefore, in 2022 DEFRA released consultation documents on Marine Net Gain, which will commence the approach from first principles.

In Ireland and Northern Ireland we recommend that BE is initially considered only for terrestrial and freshwater environments. It is likely that separate guidance will be required for marine environments.

Timescale and monitoring

Ecological compensation and enhancement measures take time to implement, and must be managed and monitored in the long-term. In the CIEEM Good Practice Guidance it is stated that *"Biodiversity compensation should be planned for a sustained net gain over the longest possible timeframe. For development in the UK, the expectation is that compensation sites will be secured for at least the lifetime of the development (e.g. often 25 - 30 years) with the objective of net gain management continuing in the future."*

This is a key issue in ecology, because many ecological features require long-term maintenance to achieve the desired effect. For example, the ecological value of a grassland can be enhanced by managing it as a traditional hay meadow, by mowing it once per year in late - summer/autumn. Over 5 - 10 years the meadow will be colonised by a range of native wildflowers, and will become high quality habitat for pollinators and a range of other species. However, if the habitat is not mowed, it will become dominated by coarse grasses, and the coverage of native wildflowers will decrease. Over 5 - 10 years it will be colonised by scrub (e.g. brambles, gorse, willows), forming a very different habitat than was originally intended. This demonstrates the importance of long-term maintenance, and the periodic monitoring by an ecologist that can address any issues.

Therefore, all BE assessments must include a timeline for the implementation of compensation and enhancement measures, including the following:

- Initial implementation of measures, typically during or immediately after construction
- Planned maintenance over the lifetime of the development, e.g. annual mowing of

meadows, spot-treatment of invasive species, cleaning droppings from bat roosts

- Monitoring of the effectiveness of BE measures, initially on an annual basis, and then at intervals of 3 - 5 years
- Review and adaptation of measures that are not working as expected, to account for unplanned events (e.g. storms, fires), or advances in best practice

From a practical perspective, planning authorities must ensure that land set aside for ecological compensation/enhancement is reserved specifically for that purpose in the long-term. It is particularly important to distinguish between BE areas and recreational areas, because the latter requires management (e.g. regular mowing) that is incompatible with BE, and may involve activities that disturb fauna (e.g. dog walkers). It is also important that BE areas are not simply re-developed after a few years.

Commitments to BE must be recorded in a planning consent, and their implementation controlled using planning conditions. The following may be included as a planning condition: *"The Biodiversity Net Gain commitments will be implemented in full over the timeline set out in the [relevant ecological report]. The applicant will submit evidence that an ecologist and maintenance team have been engaged for the duration of this period. Evidence of ongoing monitoring and maintenance must be provided to the planning authority upon request. Any remedies required during the course of the implementation, monitoring and maintenance of the BE measures will be addressed to the satisfaction of the Planning Authority"*

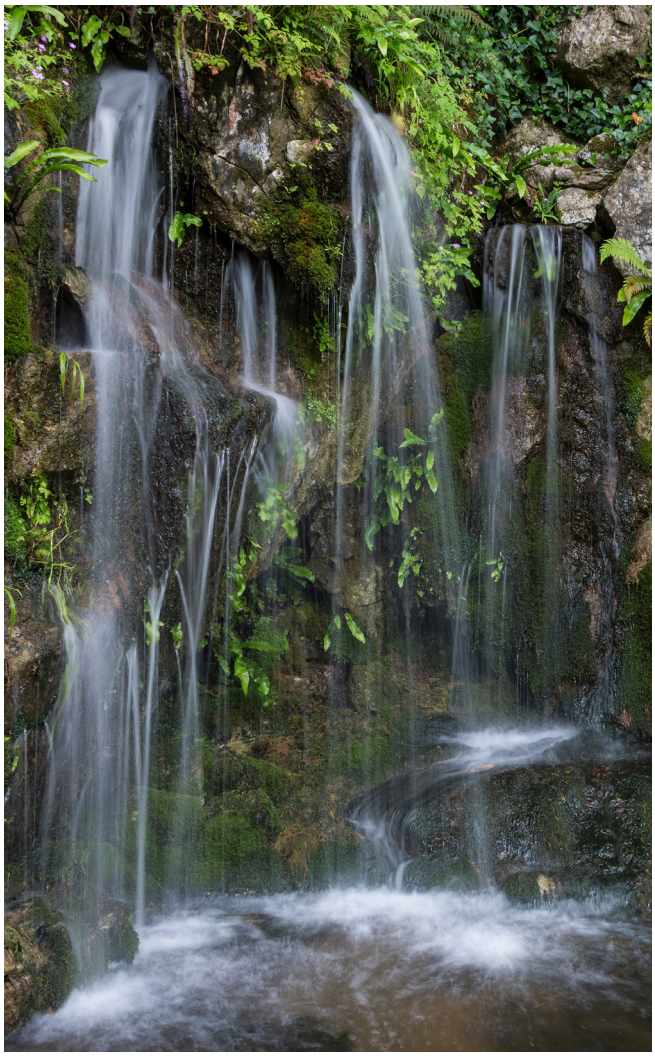
Key considerations for habitat enhancement

As a general measure, we suggest that any habitat enhancements should be based primarily on plant species that are native to Ireland and of local provenance, as they have highest suitability for Irish fauna. Non-native plant species may have some value in certain circumstances (e.g. spring flowers for pollinators), but in general terms they have lower value than native species. Non-native shrubs and flowers cannot be considered as BE measures.

Retained habitats will almost always be of higher ecological value than newly-created habitats. Ecologists should aim in the first instance to retain and enhance habitats that are present at the baseline stage. For example, existing grasslands could be enhanced by reducing mowing and allowing them to develop as meadows. Mature trees should be retained rather than clearing a site and planting immature trees.

If starting with bare/disturbed ground, current best practice under the All-Ireland Pollinator Plan is to allow areas to recolonise naturally rather than sowing seed. Subsoil is often more suitable than topsoil for this purpose, as the low nutrient levels in subsoil favour the establishment of flowering plants rather than grasses. In some circumstances it may be appropriate to sow a native meadow seed mix: if so, it should consist only of native species of Irish provenance, include a mixture of perennial flowers and grasses, and be tailored to the sites' soils and hydrology. Non-native 'wildflower' seed mixes should never be used, as they are typically of low biodiversity value. The ecologist should review species lists for any seed mixes and determine whether or not they are native and appropriate to the site.

Measures should be realistic, implementable, and evidence based. They must include long-term management plans, and details of who will implement them. The developer should consider whether biodiversity areas are 'taken in charge' by a local authority, maintained by a management company, or managed directly by residents.



Suggestions for biodiversity enhancements

Suitable biodiversity enhancement measures for a site should be determined on a case-by-case basis depending on baseline habitat features that can be retained, other habitats surrounding the site, and any species of importance in the surrounding area. In this section we provide examples of some BE that could be considered for a small suburban site:

- Provision of bird boxes, including designs suitable for common garden birds (e.g. finches, tits, blackbirds), or species that nest on buildings (swifts, martins, swallows). Swift nesting boxes should be considered for tall buildings (at least 5 m in height)
- Provision of bat boxes suitable for crevice-dwelling species. These are only suitable if installed in a part of the site that will be in complete darkness, and that are directly connected to potential foraging areas (woodland, freshwater, parks, agricultural land)
- Provision of hedgehog boxes in areas of dense shrubs, and appropriate dispersal corridors (see below)
- Provision of wildlife dispersal corridors to connect green areas outside the site boundary. These would consist of continuous lines of dense shrubs and ground vegetation, which are not obstructed by walls/fences/roads and are not illuminated by streetlights. Gaps should be provided at the base of walls/fences to allow ground-dwelling fauna to move through the site.
- Creation of a pond or similar semi-natural wetland feature with native fringing vegetation. Ponds may also be suitable for frogs/newts. These measures may be feasible for above-ground SUDS features (e.g. attenuation ponds, swales)
- Inclusion of a range of native trees and shrubs, including species that provide berries for birds (e.g. hawthorn, rowan)
- Managing grassland areas as meadows, by mowing only once per growing season and removing cuttings. Guidance is provided in the All-Ireland Pollinator Plan (see above).
- Leaving sections of landscaping for natural succession, with little or no active management
- Removal of invasive non-native species, including both legally-restricted species (e.g. Japanese knotweed, Himalayan Balsam, three-cornered garlic) and other nuisance species (winter heliotrope, cherry laurel)
- Incorporating biodiversity features on the roofs of structures including apartment roofs, cycle shelters, sheds etc. Such features should use the site's soils, and have associated long-term maintenance
- Paths and cycleways should be located in central parts of a development, away from biodiversity features and other site boundaries where treelines/hedgerows/wildlife corridors are located, retained or might be created as part of the design. The infrastructure associated with pathways and cycleways, human disturbance, vegetation management, lighting, etc can substantially reduce the biodiversity value of these features.

Conclusions

There is now a pressing need for national guidance on Biodiversity Enhancement in the Republic of Ireland and Northern Ireland. In this briefing paper we have reviewed the options available for this process, and set out some recommendations on how we would like to see it implemented in an Irish context. We hope that this will be considered by national bodies responsible for the development of BE policy in the Republic of Ireland and Northern Ireland, as part of a broader national debate.

Overall, we make the following recommendations for the ROI/NI approach:

- The primary reference document should be Biodiversity *Net Gain: Good Practice Principles for Development, A Practical Guide* (CIEEM-CIRIA-IEMA, 2019)
- A competent ecologist should be engaged from the start of the design process
- Assessments should be primarily qualitative, and consider all potential ecological features.
- Quantitative assessments based on metrics may be used to support certain aspects of a proposal (e.g. habitat compensation), but should be secondary to an over-arching qualitative assessment
- The mitigation hierarchy should always be followed sequentially. The primary emphasis should always be on avoidance
- BE assessments should be incorporated into other ecological reports (e.g. Ecological Impact Assessment, Biodiversity Chapter of an EIAR) rather than issued as a stand-alone assessment
- BE should be mandatory for all large-scale developments, e.g. infrastructure projects, renewable energy, or those that require Environmental Impact Assessment. BE should be expected for small and moderate-scale developments, although it is important to acknowledge that there will be some situations in which it will be impossible to achieve BE on-site. Therefore, it would be reasonable to provide exemptions to BE in certain cases
- Off-site compensation may be feasible in some cases, but at present it should not be considered as standard practice. A national framework for the management of off-site compensation areas would be needed before this could be implemented
- Ecological Enhancements will require long-term management and monitoring to ensure effectiveness.

Finally, we wish to emphasise that the recommendations in this document are based on the current circumstances in Ireland, but that they may change in the future. We do not wish to permanently rule in or rule out any approaches. For example, we do not currently recommend a quantitative approach in Ireland, but this may change in the future if a metric is developed specifically for an Irish context. Our intention at this stage is simply to contribute to a broader discussion about the approach to BE in the Republic of Ireland and Northern Ireland.

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CIEEM (2023) Briefing Paper: Biodiversity Enhancement for New Developments in Ireland. Chartered Institute of Ecology and Environmental Management, Ampfield.

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