GN36 BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2

Contents

1. Scope and Applicability

1.1 Applicability of this Guidance Note to the BREEAM Family of Schemes (BREEAM, CEEQUAL, HQM)

This guidance note is applicable for BREEAM, CEEQUAL and HQM schemes used in the UK which opened for registrations from 2018 onwards.

The relevance of this document to a project undergoing an assessment under any of these schemes is dependent on the version of the scheme being used. Reference should be made to the scheme Technical manual to determine this. Where there is no reference to this document, the method set out here is not relevant and cannot be used to demonstrate compliance with the assessment criteria in those versions of those schemes.

Where the term Assessor is used in this document this refers to the BREEAM, CEEQUAL or HQM Assessor as appropriate.

1.2 Purpose and Scope of this Guidance Note

This guidance note sets out the calculation methodology and process used within the above schemes for the purpose of calculating a 'change in ecological value' resulting from the project being assessed. It forms a part of the technical manual for these schemes and as such the methodology and process described forms an integral part of these scheme requirements. There are four core assessment issues which relate to ecology:

- Identifying and understanding the risk and opportunities for the project

- Managing negative impacts on ecology

- Change and enhancement of ecological value

- Long term ecology management and maintenance

The methodology and process set out in this document must be carried out by a Suitably Qualified Ecologist (see the 'Identifying and understanding the risks and opportunities for the project' assessment issue for the definition of a Suitably Qualified Ecologist). It is used to calculate the change in ecological value resulting from a project for the purposes of the Assessment.

This methodology is directly relevant for calculating change in ecological value and therefore is an integral part of the 'Change and Enhancement of Ecological Value' assessment issue. However it is also relevant for other issues and appropriate stages must be considered as part of the 'Identifying and understanding the risks and opportunities for the project' assessment issue.

The considerations and outputs generated from the methodology set out in this guidance note will also inform the assessment and achievement of the following issues or their equivalents:

- Managing negative impacts on ecology

- Long term ecology management and maintenance

See the relevant assessment issue in the appropriate technical manual.

The outputs of this calculation are used by the Assessor to determine the reward (e.g. credits/points) available for the 'Change and Enhancement of Ecological Value'. It forms part of the assessment route 2 in ecology related assessment issues.

This route is defined as follows:

1.3 Route 2: For Sites Where Complex Ecological Systems are Likely to be Present

This is the more comprehensive route of assessment and as such can achieve a higher level of reward than Route 1 (See GN 34: BREEAM CEEQUAL and HQM Ecology Risk Evaluation Checklist for a definition of Route 1 and details of when it can be applied). Route 2 results in a higher potential overall reward and as such is better able to provide recognition for project teams' actions and project outcomes under an Assessment.

The methodology outlined in this document does not apply to assessments being assessed under Route 1.

2. Background to the Methodology Development

Significant advances in understanding, measurement, calculation and data quality have occurred since BREEAM started evaluating the change in ecological value in 1998. These changes have been taken into account in determining the methodology set out in this document. It has been developed with input and guidance from a range of public and professional bodies, practising ecologists and other relevant experts and stakeholders. The approach and calculation methodology in this note was developed by WSP, with input from Balfour Beatty and Footprint Ecology, under contract with BRE.

It builds on the work of Defra and Natural England in calculating Biodiversity Units (see Appendix A: Definitions) (the 'Defra Metric') and as such, is supportive of government policy in terms of environmental protection and enhancement of biodiversity. This approach is being increasingly adopted by developers, local authorities and others, and relates well to other requirements and processes required of project teams through planning and elsewhere. However the methodology is intended for use within the BREEAM, HQM and CEEQUAL assessment schemes used in the UK and should not be used for other purposes without careful consideration of its relevance.

BRE intends to update this methodology as appropriate as and when the Defra Metric is amended, to avoid conflicts with current best practice and unnecessary burdens or duplication when determining and demonstrating the ecological impacts of development and management activities.

3. Overview of the Methodology

The methodology used within the BREEAM family complements, but does not negate or replace the need for, any legally required ecological assessment.

This methodology uses the change in 'Biodiversity Units' as an indicator of a site's change in ecological value overall and is based on the approach set out in the Defra Metric. It uses a simplified set of key ecological attributes and assessment characteristics to provide an appropriate degree of consistency and comparability.

> **Go to Appendix A: Definitions to understand more about:**
>
> - Biodiversity Unit
> - Linear Habitats
> - Area Based Habitats
> - Condition
> - Distinctiveness
> - Development Footprint
> - Zone Of Influence
> - Low Impact Developments

The methodology requires the calculation of Biodiversity Units for both linear and Area Based Habitats impacted by a project and is carried out Pre and Post Development. It provides a simple and accessible means of estimating changes, promoting ecological protection, mitigation and enhancements in relation to the built environment.

The methodology is therefore an accounting tool, used to demonstrate biodiversity losses and gains and so determine the awarding of credits/ points as relevant to the scheme. It should not be used for other purposes without careful consideration of its relevance to the task being undertaken.

The methodology is based on three main attributes:

i.   the area or length of habitats (dependent on their type),

ii. their condition and,
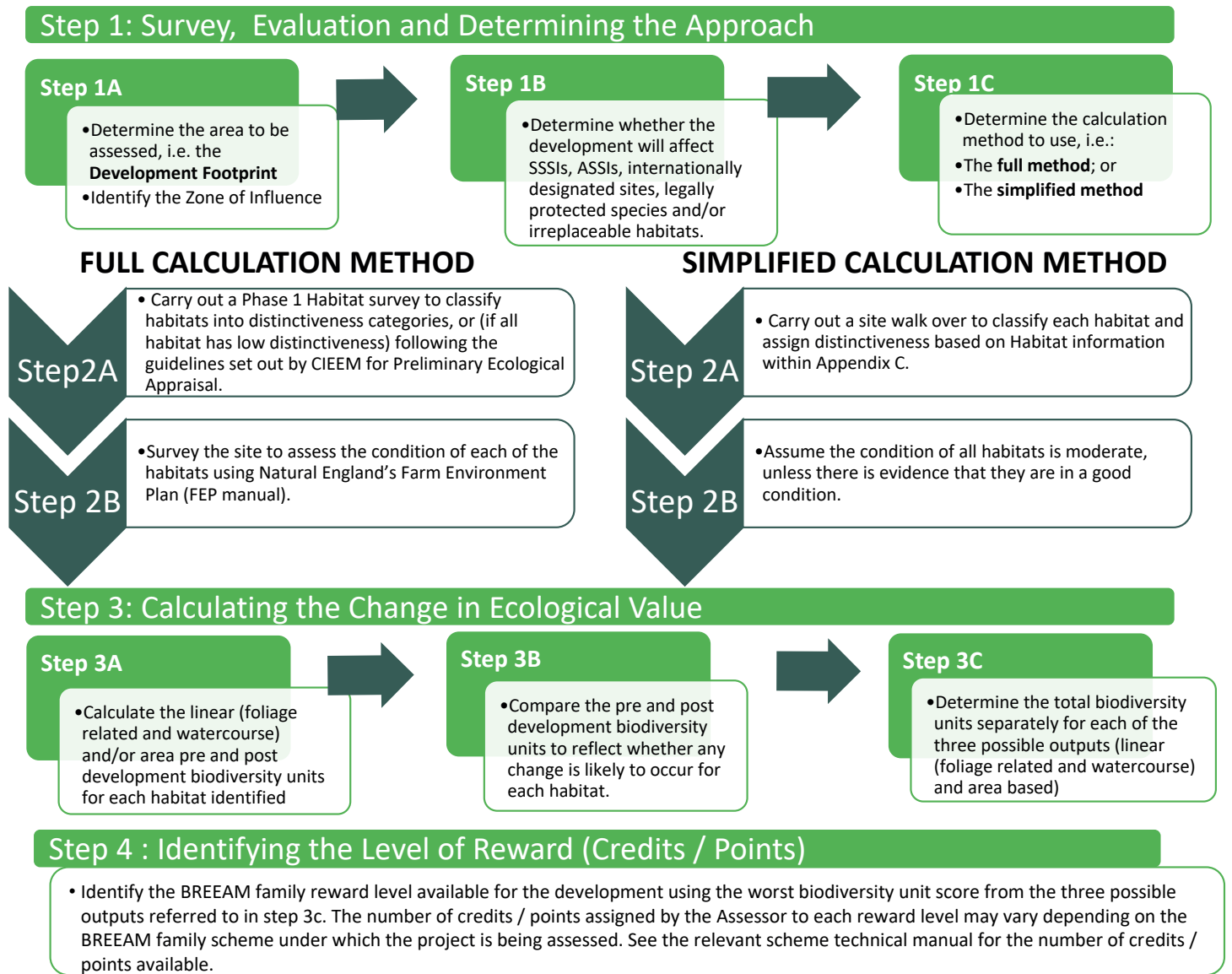
iii. their distinctiveness.

These attributes are assigned numerical values to allow Biodiversity Units to be calculated for each habitat type. The number of Biodiversity Units can then be compared before and after the development to determine a change and so give an indication of the change in overall ecological value.

Whilst many sites have significant ecological value (often, but not always, recognised through the planning process), many others have limited value Pre Development but these still have potential to enhance value through development and management changes. For many sites, overall value is and will remain relatively insignificant. It is, therefore, important that an appropriate level of rigour is used to consider ecological impacts commensurate with the complexity and scale of potential impacts and the risks involved. For this reason the methodology is split into a full approach and a simplified approach. The simplified approach can only be used for developments with low level risks to ecological value and biodiversity. The following section provides more detail about this approach.

Both the full and simplified approaches follow the format set out within the Defra Metric (Defra 2012 a, b and c), and are adapted to ensure that it is appropriate for the built environment and hence the BREEAM family of schemes.

The calculation methodology requires the Suitably Qualified Ecologist (SQE) to undertake site visits and surveys of the existing habitats within the Development Footprint and (if relevant) any areas of habitat affected indirectly as well as land offsite that is being used for habitat creation or enhancement to mitigate or offset on-site impacts. These surveys are used to establish a value for three attributes (described in the following sections of this document) and should be undertaken before any works commence, including preparatory works such as site clearance. They should be carried out alongside any other required ecological surveys wherever possible (e.g. for planning purposes).

Figure 1 - Change in Ecological Value Methodology Overview

Step 1: Survey, Evaluation and Determining the Approach

Step 1A
- Determine the area to be assessed, i.e. the **Development Footprint**
- Identify the Zone of Influence

Step 1B
- Determine whether the development will affect SSSIs, ASSIs, internationally designated sites, legally protected species and/or irreplaceable habitats.

Step 1C
- Determine the calculation method to use, i.e.:
- The **full method**; or
- The **simplified method**

FULL CALCULATION METHOD

Step2A
- Carry out a Phase 1 Habitat survey to classify habitats into distinctiveness categories, or (if all habitat has low distinctiveness) following the guidelines set out by CIEEM for Preliminary Ecological Appraisal.

Step 2B
- Survey the site to assess the condition of each of the habitats using Natural England's Farm Environment Plan (FEP manual).

SIMPLIFIED CALCULATION METHOD

Step 2A
- Carry out a site walk over to classify each habitat and assign distinctiveness based on Habitat information within Appendix C.

Step 2B
- Assume the condition of all habitats is moderate, unless there is evidence that they are in a good condition.

Step 3: Calculating the Change in Ecological Value

Step 3A
- Calculate the linear (foliage related and watercourse) and/or area pre and post development biodiversity units for each habitat identified

Step 3B
- Compare the pre and post development biodiversity units to reflect whether any change is likely to occur for each habitat.

Step 3C
- Determine the total biodiversity units separately for each of the three possible outputs (linear (foliage related and watercourse) and area based)

Step 4 : Identifying the Level of Reward (Credits / Points)

- Identify the BREEAM family reward level available for the development using the worst biodiversity unit score from the three possible outputs referred to in step 3c. The number of credits / points assigned by the Assessor to each reward level may vary depending on the BREEAM family scheme under which the project is being assessed. See the relevant scheme technical manual for the number of credits / points available.

# 4. Determining the Applicable Change in Ecological Value Calculation Approach

The calculation methodology applied by the SQE to determine the change in ecological value will follow either the full or simplified approach as set out in Figure 2.

The simplified approach can be used for projects where Pre Development ecological value is likely to be low and where there is deemed to be a low risk of impact on biodiversity. For the purposes of BREEAM, these are defined as projects that have a total area less than 0.05 hectares (ha) of habitats within the Development Footprint in total Pre Development and where there are no habitats present that are assigned a high level of distinctiveness (see Table 1: Habitat Distinctiveness Bands and Scores) for further details.

To determine which approach should be followed, the area of all habitats within the Development Footprint (see definitions appendix) should be identified using data from (in priority order, where available) recent ecological assessments, recent aerial photography, local environmental record centres and web based map such as MAGIC (http://magic.defra.gov.uk/). This should provide the necessary information to identify the most appropriate type of site survey required, before visiting the site. If there is any doubt on whether the above criteria are met, the full method should be used.

The following diagram (Figure 2) outlines the steps to identify the appropriate approach for the calculation of 'change in ecological value'.

Figure 2 - Steps to Identify the Applicable Change in Ecological Value Calculation Approach
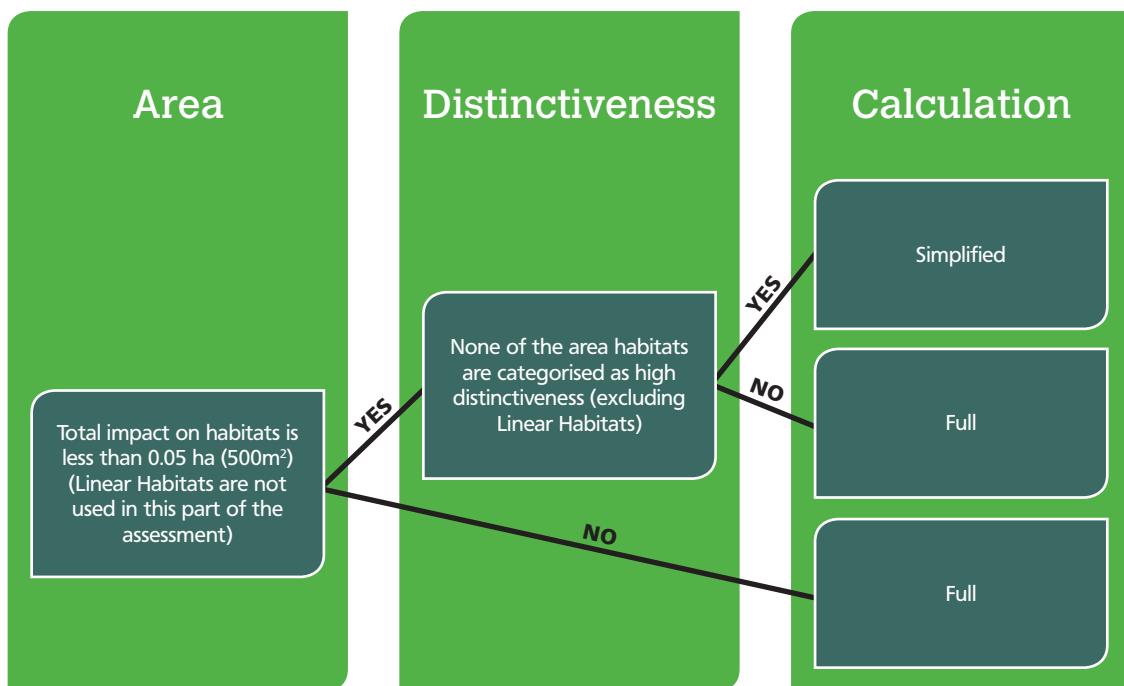
Habitats of high distinctiveness are equivalent to the habitats of principal importance identified in the Natural Environment and Rural Communities Act (NERC) Act (2006). The presence of these can be checked using data provided by Natural England or equivalent body on MAGIC or data from the relevant local environmental record centre.

If the data gained from any site walk-over or survey differs from that used to select the route (e.g. using only aerial photography and data from MAGIC) so that a different methodology would have been appropriate, the SQE should re-assess the required approach selection accordingly.

5. Change in Ecological Value Calculation Methodology

5.1. The Defra Metric and its Link to this Methodology

This methodology follows the biodiversity metric approach as set out by Defra (2012 a, b and c). It enhances and evolves this version of the Defra metric in the following ways:

- It uses Phase 1 habitat classification,

- It includes a number of additional urban habitats in addition to the list of Phase 1 habitat types,

- Individual trees and lines of trees are treated in the same way as Area Based Habitats,

- Linear features are included through the multiplication of their length and condition to determine Linear Biodiversity Units,

- The spatial risk factor has been predefined rather than leaving this to be set at the project level,

- The scoring within the spatial risk factor has been altered to better reflect the relative importance of the proximity of the habitat creation to the area of impact within the methodology. This decreases the impact that the spatial multiplier has, and

- The difference between enhancement and creation of habitats has been set out.

5.2. DEFRA Steps for Determining Pre Development Biodiversity Units

In line with Defra's guidance, the following steps are required to calculate Pre Development Biodiversity Units:

- Score each habitat for distinctiveness as high (6), medium (4) or low (2). For hedgerows and watercourses assume distinctiveness is high,

- Assess the condition of the habitat using the methodology described in Natural England's Farm Environment Plan (FEP) Manual (Natural

> **Linear Biodiversity Units and the Defra Metric**
>
> **Linear Biodiversity Units are not described within the Defra metric but used in this methodology to provide clarity on habitat types and to keep these separate in calculation approaches.**

England 2010). Score each habitat for condition as good (3), moderate (2) or poor (1). Please note that if a different methodology is used its use needs to be justified within the report,

- Measure the area (in hectares or square metres) or length (in metres) of the habitat (ensuring the same unit is used throughout the assessment).

5.3. Habitat Distinctiveness, Condition and Risk Factors

Habitat Distinctiveness

Habitat distinctiveness is a measure of biodiversity that has regard for the number and variety of species found there (richness and diversity), how rare the species are, and how many species the habitat supports that are not common elsewhere.

For the purpose of the BREEAM family assessments habitat distinctiveness is scored against a three category scale (high, medium and low) as detailed in Table 1. Broadly, all Habitats of Principal Importance will be assigned high distinctiveness, other habitats which are not Habitats of Principal Importance will be assigned medium distinctiveness and any habitats which have been intensively managed such as improved grassland or arable pasture will be assigned low distinctiveness.

Table 1 – Habitat Distinctiveness Bands and Scores

Distinctiveness Band	Distinctiveness Score	Habitats Types Included
High	6	Habitats of Principal Importance i.e. those which meet the criteria to qualify as Habitats of Principal Importance (JNCC 2011) as they are not included in the assessment. This excludes ancient woodland and other habitats which are irreplaceable.
Medium	4	Other semi-natural habitats that do not fall within the scope of Habitats of Principal Importance definitions, i.e. all other areas of woodland (e.g. mixed woodland), other grassland (e.g. semi-improved grasslands), uncultivated field margins, road verge and railway embankments (excluding those that are intensively managed).
Low	2	Improved grassland, arable fields (excluding any uncultivated margins), built up areas, domestic gardens, regularly disturbed bare ground (e.g. quarry floor, landfill sites etc.), verges associated with transport corridors.

For some habitat types within the Phase 1 classification, multiple distinctiveness bands can apply, depending on the quality of the habitat. For example, it is important any Habitats of Principal Importance can be identified alongside the Phase 1 classification. Appendix C details these habitat types and provides information to help to assign the appropriate distinctiveness band.

Habitat Condition

Condition is defined as the quality of a particular habitat. For example, a habitat is in poor condition if it fails to support the rare or notable species for which it is valued, or if it is degraded as a result of pollution, erosion, invasive species or other factors.

The Defra metric requires habitat condition to be assessed. The approach suggested by Defra is presented in Natural England's FEP manual (Natural England 2010). The simplified method does not require a condition assessment as the condition is assumed for the habitats present.

For the full method whilst completing the Phase 1 habitat survey, once the habitat has been identified, the SQE should look up the habitat in the FEP Manual. If the type of habitat differs from the types in the FEP Manual, match the habitat to its best equivalent habitat, recording the reasons. If the habitat or an equivalent is not present within the FEP, Table 3 – Default Condition Assessment should be used to assign a condition score. Gather information to assess the criteria as to whether the habitat passes or fails each one. For the purpose of a BREEAM family assessment count the total number of passes and fails and score the condition as detailed in Table 2.

Table 2 - Habitat Condition Bands and Scores

Condition Band	Condition Score	Criteria for Assigning Condition
Good	3	Any habitat which passes all the FEP criteria.
Moderate	2	Any habitat which fails one FEP criterion.
Poor	1	Any habitat which fails two or more FEP criteria.

In addition to the information set out in this guidance document, a methodology for condition assessment of the habitats is needed. This guidance recommends using the Farm Environment Plan (FEP) Manual (Natural England 2010) or, if the habitat or an equivalent is not present within the FEP, in Table 3 – Default Condition Assessment should be used to assign a condition score.

Table 3 – Default Condition Assessment

For use when the habitat present is not covered by the Farm Environment Plan (FEP) condition assessment methodology (Natural England 2010). If some of the criteria are not relevant for the habitat being assessed the SQE should use their expert judgement to select the appropriate criteria.

Criterion	Commonly Used Habitat Condition Assessment Criteria in the FEP
1	A diverse age range
2	A diverse species mix
3	Diverse structure variety/diverse form
4	Presence of protected species
5	None or a limited presence of invasive species
6	No or limited damage for example by machinery

Where an FEP condition assessment is not possible and the condition cannot be based on local relevant data (such as surveys on other similar habitats within the Development Footprint) the condition of the habitats should be assumed to be moderate, giving a condition score of 2, unless there is other evidence that the habitat is of good condition, such as the presence of species of principal importance. If a different methodology is used the SQE should set out why it has been used and provide evidence to demonstrate why that methodology is more appropriate.

Risk Factors Application to the Post Development Calculation

Risk factors take account of the likely scale of impact and the potential for success or failure of a habitat to be established over time. They are currently only applicable to area based habitat calculations. The Post Development Biodiversity Unit calculation should consider the risks and account for them, as they can influence the overall outcome. The risk factors do not cover all eventualities, but provide a numerical value for the main risks to delivering biodiversity gains.

The Defra metric sets out three risk factors:

1. distance from scheme (spatial risk);

2. time taken for created or enhanced habitats to reach target condition (temporal risk); and

3. how difficult it is to create or enhance any given habitat (delivery risk).

1. Spatial risk

Spatial risk is the risk associated with delivering compensation for the loss of a habitat at a distance from that loss (i.e. generally a greater distance can mean a greater risk) and in relation to areas of strategic priority for biodiversity. Therefore, the spatial risk factor is applied to the Post Development Biodiversity Unit calculation when the compensation for habitat loss is being delivered at distances prescribed in Table 4.

Numerical Spatial Risk Factors
The numerical risk factors for the spatial risk have been altered from the Defra metric. This is to better weight the impact of the spatial factor within the methodology so that it reflects the relative importance of proximity to the impact when creating a new area of habitat. The delivery risk and the time taken to create a habitat have a large impact on the success of the habitat creation than the proximity to the area of impact.

Table 4 – Spatial Risk Factors

Location of Habitat Creation or Enhancement	Risk Factor
Habitat being created or enhanced is within 500m of the area of loss or in the same ecological network identified in a local (county or equivalent) biodiversity, green infrastructure or offsetting strategy	1
Habitat type being created or enhanced contributes to and is in a location identified within a local (county or equivalent) biodiversity, green infrastructure or offsetting strategy	0.67
Habitat being created or enhanced is not making a contribution to local (county or equivalent) biodiversity, green infrastructure or offsetting strategy.	0.50

Adapted from the Defra metric, 2012

Spatial Factors - Calculation Considerations

1. Where the SQE is able to demonstrate that the habitats created or enhanced are outside of an area identified within a local (county or equivalent) biodiversity, green infrastructure or offsetting strategy but provide a meaningful contribution to achieving the objectives of the strategy (e.g. buffering the site) then the SQE can apply the 0.67 spatial risk factor and set out justification for doing so in the final report.

2. Spatial risk factors can be excluded if the loss of the Pre Development habitat has a low distinctiveness and is compensated for within 1km of the area lost, unless the SQE determines the Pre Development habitat was providing vital habitat for a species with a shorter homing range. In these instances the relevant spatial risk factor should apply. In this instance, a risk factor of 1 should be applied.

2. Delivery risk

Delivery Risk is the risk associated with the difficulties linked to the creation or enhancement of any specific habitat. Appendix 1 of Defra's Technical Paper (2012 a) provides an indicative guide to broad categories of risk for different habitats. The information in Appendix C and Table 5 below provides risk factors that should be used for this methodology. For habitat types not listed in Appendix C or Defra's guidance, SQE opinion based on evidence relevant to the habitat type should be used to determine the appropriate level of delivery risk (and this should be fully described and justified in the report). This should be informed by delivery risk levels assigned to similar habitat types by Defra. Table 6 shows factors assigned to each level of delivery risk.

Table 5 – Defra's Delivery Risk Factors

Difficulty of Recreation / Enhancement	Risk Factor
Very High	0.10
High	0.33
Medium	0.66
Low	1

Adapted from the Defra metric, 2012

3. Temporal risk

In delivering compensation for habitat loss, the timing of the impact may not coincide with the new habitat reaching the required quality or level of maturity, which could result in loss of biodiversity for a period of time. Additionally there may be a time gap between the habitat loss and the start of the creation or enhancement of a new habitat. Where possible, the development should decrease or prevent this additional time gap. Where this is not possible and is justified, this additional time gap needs to be accounted for. These two time lags together are called the temporal risk. For example, a development clears an area of woodland. Five years later it implements its offset, which will take 25 years to reach target condition. So the time to target condition is 30 years (i.e. from the time of habitat clearance) and the associated risk factor is 0.36.

The risk factors are defined by Defra as outlined in Table 6.

Table 6 – Defra's Temporal Risk Factors

Years to Target Condition	Risk Factor
5	0.84
10	0.71
15	0.59
20	0.50
25	0.42
30	0.36
>30	0.33

Adapted from the Defra metric, 2012

There is no set guidance for each habitat type on the time it takes to reach a specific condition. However, the information in Appendix C should be used along with evidence, where this exists, and expert opinion relevant to the habitat type to estimate number of years to target condition and be fully justified within the final report.

5.4. Key Aspects of the Methodology

The same change in ecological value calculation methodology is applicable for the full and simplified approach. This involves the following:

1. Calculation of Linear and Area Biodiversity Units for the habitats pre and post development. The following factors facilitate this:

a. Linear Habitats

    i. The length of the habitat

    ii. The condition of the habitat

    iii. Whether habitat is lost, created and/or enhanced

    Output = Linear Biodiversity Units (separate outputs for watercourse and foliage based habitats)

> **Two Types of Linear Biodiversity Unit Output**
>
> **Due to differing methodology needed for Linear Habitats and the variation in the ecology benefits they can bring, there are two types of Biodiversity Unit outputs which are kept separate within the calculation of value Pre and Post Development. These cover:**
> - **Watercourse based habitats and,**
> - **foliage related habitats (i.e. everything other than watercourses covered by the linear habitat definition – see Appendix A)**

b. Area Based Habitats

    i. The area of the habitat

    ii. Habitat distinctiveness

    iii. The condition of the habitat

    iv. Whether habitat is lost, created and/or enhanced

    v. For the Post-Development calculations the following risks should also be taken into consideration

        a. Spatial

        b. Temporal

        c. Delivery

    Output = Area Biodiversity Units

2. For the above habitat types compare the pre and post development Biodiversity Units in order to calculate change and therefore the change in ecological value.

3. Calculate the overall change in Biodiversity Units as a percentage for each of the following:

    a. watercourse based linear habitat types

    b. foliage based linear habitat types

    c. area based habitat types

4. Determine the reward (credit/points) applicable for the development

    This is undertaken by the Assessor.

The lowest percentage score should be used to identify the number of credits available. In addition, requirements relating to designated sites and/or irreplaceable habitats and the Mitigation Hierarchy must also be taken into consideration before confirmation can be given that reward is available. See Section 6. Determining the Change in Ecological Value and Assigning Reward (credits/points) for more information.

1 Defra guidance states time to target condition by single years (e.g. 5 years, 10 years, 15 years etc). For clarification, this has been adapted in the table to show the range of years to which each multiplier should be assigned.

Keeping Linear Habitats and Area Habitats and Associated Biodiversity Units Separate

Linear Habitats and Area Habitats are treated separately for the purposes of Biodiversity Unit calculations as above The contribution Linear Habitats make to the biodiversity in the landscape is far greater per unit of area than even the most biodiversity rich localised habitats because of their multiple role in the provision of nest sites, corridors, feeding sites, shelter belts etc. (Defra 2012 a). As a result these habitats are treated separately from Area Based Habitats that are accounted for on a hectare basis.

Linear Habitats - Keeping Foliage Habitats and Watercourse Calculations Separate

When calculating Linear Biodiversity Units, the foliage based habitats (i.e. everything other than watercourses covered by the linear habitat definition – see Appendix A.) and watercourses calculations should be completed independently. This is partly because they provide habitat spaces which are not comparable with each other e.g. a hedge does not provide the same habitat benefits as a brook. Another reason for keeping these outputs separate is because there is no set method for assessing the condition of watercourses.

Creation and Enhancement

Habitat creation consists of the removal or the loss of any present habitat(s) in the action of creating the new one or creating habitat where none was previously present. For example, removing scrub habitats in order to create a wetland habitat or removing hardstanding to create grassland.

Habitat enhancement consists of improving the condition of an existing habitat and thereby increasing the ecological value of a habitat type through measures that improve its biodiversity capacity and/or by removing factors that detract from its value, such as by increasing the diversity of species that can be supported by a habitat. For example, managing improved grassland so that it becomes semi-improved grassland.

Post Development Biodiversity Units are calculated to reflect whether the change is as a result of the habitat being enhanced or the existing habitat is being lost and a new one created.

It is important to clearly identify which areas of habitat are being created and which are enhanced.

Decisions on which habitats are created or enhanced should be based on Area and Linear Biodiversity Units of individual habitats in combination with qualitative ecological information, and not simply the total number of Units.

For compensation to be taken into consideration in the assessment calculations, it should be the same habitat type as that which has been or will be lost and of the same or higher ecological value. If a habitat of higher ecological value is created or enhanced, it should be an appropriate habitat type that is still capable of supporting the species affected by the habitat loss resulting from the development. For example it is appropriate to replace semi-improved grassland with unimproved grassland.

If the development has no negative impact on biodiversity, the area of habitat created should be compared to the area of the Development Footprint to calculate the percentage of the Development Footprint that

Good Practice Principles Applied to BREEAM Ecological Assessments

CIEEM, CIRIA and IEMA (2016) have produced good practice principles and guidance for delivering biodiversity net gain in developments. These principles provide a framework that helps improve the UK's biodiversity by contributing towards strategic priorities to conserve and enhance nature while progressing with sustainable development. They also provide a way for industry to show that projects followed good practice.

https://www.cieem.net/data/files/Publications/Biodiversity_Net_Gain_Principles.pdf

is covered by habitats. A length of linear habitat should also be provided, as appropriate to the site and of an appropriate length justified by the SQE.

Linear and Area Based Biodiversity Units and their Calculation

Linear and Area Biodiversity Units must be calculated for the habitats both Pre Development and Post Development and these compared in order to calculate a change in ecological value for each habitat present within the Development Footprint/Zone of Influence as follows:

1. The Pre Development units are calculated based on the habitats present on the site prior to development including any site clearance, temporary use of land and preparatory works. These are calculated to provide a baseline of the ecological value of the site.

2. The Post Development units are calculated based on the temporary use of land during the development and the post development landscape plans or equivalent.

3. The Pre and Post Development units are then compared with one another to reflect whether any change is likely to occur as a result of the habitat being enhanced, the existing habitat being lost or a new one created.

Area Based Biodiversity Units and Linear Biodiversity Units are both arbitrary units which are not comparable with each other.

Linear Habitat Calculations and Outputs
Where both are present there are two separate calculations and outputs for Linear Biodiversity Unit:
- **Watercourse based habitats**
- **Foliage related habitats (i.e. everything other than watercourses covered by the linear habitat definition – see Appendix A)**

5.5. Linear Habitats – Calculation Formulae and Associated Notes

Linear Habitats are habitats that form linear ecological features such as lines of trees, hedgerows, ditches and water courses and in some cases, green walls (climbers). To account for the value of the Linear Habitats, Linear Biodiversity Units are calculated. These units are a measure of ecological value of the Linear Habitats in the Development Footprint. Linear Biodiversity Units are derived from a calculation using numerical values assigned for only the condition and length of a habitat. When calculating these units watercourses are kept separate from other types of linear habitat. See Section 5.4: Key Aspects of the Methodology for more information.

The calculation methodology below is broadly the same for both the full and simplified approaches. The key difference is that a condition assessment is not required for the simplified approach where the condition level is assumed. See general calculation notes.

Calculation Formulae and Associated Notes

Pre Development (Pre-D)

Calculating the Pre Development Linear Biodiversity Units involves:

a) Determining the Linear Biodiversity Unit(s)

i) Length of Linear Habitat type (m) x Condition =

Pre-D Linear Biodiversity Units (per habitat type)
A

Note: the above must be completed for each linear habitat in the Development Footprint.

b) Determining the total sum of Linear Biodiversity Units

i) Sum all Pre-D Linear Biodiversity Units =

Total Pre-D Linear Biodiversity Units
B

Linear Habitats – Distinctiveness

'The contribution of hedgerows, water courses and other Linear Habitats to biodiversity in the landscape is far greater per unit of area than many of the most biodiversity rich habitats because of their multiple roles in the provision of nest sites, corridors, feeding sites, shelter belts etc.

For this reason, BREEAM assumes that all Linear Habitats will be of high distinctiveness both Pre and Post Development. To simplify the calculation distinctiveness is, therefore, not included as part of the Linear Biodiversity Unit calculation. This follows the approach set out by Defra. In situations where an ecologist takes the view that a linear feature is of significantly lower biodiversity value than this suggests, the Condition Factor can be used to make allowance for this in the calculation.

Natural England are currently reviewing their approach to linear features. It is BRE's intention to take the outcomes of this into account in future revisions of this calculation once a new approach has been agreed.'

Post Development (Post-D)

Post Development Linear Biodiversity Units are calculated as follows:

a) Identify Linear Habitat Lost

i) Length of each Linear Habitat Type LOST (m) x Condition =

Post-D Linear Biodiversity Units Lost Due To Development (per habitat type)
C

Note: the above must be completed for each linear habitat in the Development Footprint.

ii) Sum all Post-D Linear Biodiversity Units LOST (m) of previous calculated per habitat type =

Total Post-D Linear Biodiversity Units Lost Due To Development
D

b) Identify Linear Habitat Created and/or Enhanced

i) Length of Linear Habitat Type Created and or Enhanced (m) =

Post-D Linear Biodiversity Units Created and/or Enhanced Due To Development (per habitat type)
E

Note: the above must be completed for each linear habitat in the Development Footprint.

ii) Sum all Post-D Linear Biodiversity Units Created and/or Enhanced =

Total Post-D Linear Biodiversity Units Created and/or Enhanced Due to Development
F

c) Total Post -D Linear Biodiversity Unit(s)

i) (Total Pre-D Linear Biodiversity Units – Total Linear Biodiversity Units LOST Due to the Development) + Total Length of Linear Habitat to be Created and/or Enhanced (m) =

Total Post-D Linear Biodiversity Units for the development
$(B - D) + F = G$

d) Percentage Change in Linear Biodiversity Units

i) (Total Post-D Linear Biodiversity Units ÷ Total Pre-D Linear Biodiversity Units) x 100 =

Percentage change in Linear Biodiversity Units rounded to the nearest whole percentage point
$(G \div B) \times 100$

Table 7 – Linear Habitats: Calculation Notes

General	Pre Development (Pre-D)	Post Development (Post-D)
Linear Biodiversity Units gained Length of linear habitat created is equal to linear units gained. **Identifying the length of habitat** The habitat length and habitat type should be identified from existing data (e.g. aerial photography) or a site walk-over. **Hedgerows and watercourses: distinctiveness level** All hedgerows and watercourses are assumed to be of high distinctiveness because most hedgerows and rivers will meet the Habitat of Principal Importance (HPI) criteria. For this reason, distinctiveness is not included as part of the Linear Unit calculation. This follows the approach set out by Defra. **Simplified Approach** **Applicability of the condition assessment** In order to decrease the time taken to run the simplified assessment, a condition assessment is not required. Instead a condition score will be assumed for all habitats. To provide an average condition score it is assumed that the condition of all habitats is moderate unless there is evidence that habitats are in good condition, then good condition will be assigned. Also see Table 2 for Habitat Condition Bands and Scores	**Watercourses** There is no set method for assessing the condition of water courses. If a suitable method is not available it should be assumed that all water courses on the site are in moderate condition unless it is canalised in which case assume it is of poor condition **Simplified Approach** **Applicability of the Pre-D calculation - no impact on biodiversity** If the development has no impact on biodiversity at all, calculation of Pre Development units can be skipped and the Post Development units calculated as set out.	**Watercourses** It is often not possible to create watercourses but it is possible to improve their condition. In this case the length of water course that undergoes meaningful improvement, such as reinstating meanders or marginal vegetation. **Risk factor applicability** The risk factors (delivery, special, temporal) are not included in the calculation for Linear Habitats. This is because the risks associated with creating the linear features are considered to be taken into account within the condition multiplier used to calculate the Pre Development Linear Units.

5.6. Area Based Habitats – Calculation Formulae and Associated Notes

An area based habitat is any habitat that is assessed using an area based measure. This effectively means that it covers all habitats other than features assessed as Linear Habitats (see Appendix A: Definitions).

The calculation methodology below is the same for both the full and simplified approach. The key difference is that a condition assessment is not required for the simplified approach. The condition level is assumed.

Calculation Formulae and Associated Notes

A) Pre development (Pre-D)

Calculating the Pre Development Area Based Biodiversity Units involves:

a) Determining the area based biodiversity unit(s)

i) Distinctiveness x Condition x Area (ha or m²) =

Pre-D Area Biodiversity Units (per habitat type)
A

Note: the above must be completed for each area based habitat in the Development Footprint.

b) Determining the total sum of linear Biodiversity Units

i) Sum all Pre-D Area Biodiversity Units previous calculated per habitat type =

Total Pre-D Area Biodiversity Units
B

B) Post development (Post-D)

Post development Area Biodiversity Units are calculated as follows:

a) Identify Area Based Habitat Lost

i) Distinctiveness x Condition x Area LOST (ha or m²) =

Post-D Area Biodiversity Units Lost Due To Development (per habitat type)
C

Note: the above must be completed for each linear habitat in the Development Footprint.

ii) Sum all Post-D Area Biodiversity Units LOST (ha or m²) =

Total Post-D Area Biodiversity Units Lost Due To Development
D

b) Identify Area Based Habitat Gained (Created And/Or Enhanced)

i) Creation

Post-D Distinctiveness x Post-D Target Condition x Post-D Area (ha) x Delivery Risk x Temporal Risk x Spatial Risk =

Post-D Area Biodiversity Units Created Due To Development (per habitat type)
E

ii) Enhancement

(Post-D Distinctiveness x Post-D Target Condition x Post-D Area (ha) - Pre-D Biodiversity Units for the area of the habitat that is enhanced) x Delivery Risk x Temporal Risk x Spatial Risk =

Post-D Area Biodiversity Units Enhanced Due To Development (per habitat type)
F

> **Pre-D Biodiversity Units are determined from calculating distinctiveness, condition and area for the habitat.**

Note: the above must be completed for each area based habitat in the Development Footprint.

c) Total Post Development Area Biodiversity Units

i) Pre-D Area Biodiversity Units – Area Biodiversity Units LOST Due to Development + Post-D Area Biodiversity Units (Creation) + Post-D Biodiversity Units (Enhancement) =

Total Post-D Area Biodiversity Units
$G = (B - D) + (E + F)$

d) Percentage Change Area Biodiversity Units

(Total Post-D Area Based Biodiversity Units ÷ Total Pre-D Area Based Biodiversity Units) x 100 =

Percentage change in Area Based Biodiversity Units rounded to the nearest whole percentage
$(G \div B) \times 100$

Table 8 – Area Based Habitats Calculation Notes

General	Pre Development (Pre-D)	Post Development (Post-D)
Hard standing and buildings Hard standing and buildings should be included in this calculation although the condition and distinctiveness of the habitats will be given a zero score. **Simplified Approach** **Applicability of the condition assessment** In order to decrease the time taken to run the simplified assessment, a condition assessment is not required. Instead a condition score will be assumed for all habitats. To provide an average condition score it is assumed that the condition of all habitats is moderate unless there is evidence that habitats are in good condition, then good condition will be assigned. Also see Table 2 for Habitat Condition Bands and Scores	**Simplified approach** **Applicability of the Pre-D calculation** If the development has no impact on biodiversity at all, calculation of Pre Development Area Biodiversity Units can be skipped and the Post Development units calculated	**Risk factor applicability** Risk factors covering the spatial, temporal and delivery risk associated with creating or enhancing a habitat are included in the calculation. **Enhanced Habitat versus Lost Habitat** Areas of enhanced habitat are not considered lost and should not be included in the Area Biodiversity Units Lost.

6. Determining the Change in Ecological Value and Assigning Reward (Credits/Points)

Applying the calculation methodology enables a project to determine the level of reward of BREEAM, CEEQUAL and HQM credits or points which the Assessor can award.

All three outputs of the calculation must be considered:

- Linear Biodiversity Units: Foliage related habitats,

- Linear Biodiversity Units: Watercourses habitats,

- Area Based Biodiversity Units: Area based habitat.

The output with the lowest percentage score (rounded to the nearest whole percentage point) should be used to identify the reward level available for the development as follows:

- 75% and 94% - Minimising loss,

- 95% and 104% - No net loss for the habitats assessed,

- 105% and 109% - Net gain for the habitats assessed,

- 110% or above - Significant net gain.

There are also additional requirements associated with each level of the reward levels which are detailed in Table 9:

The number of credits or points assigned to each reward level will vary depending on the BREEAM family scheme under which the project is being assessed. For this reason the number of credits or points associated with each reward level have not been listed in this document. See the relevant scheme technical manual for the number of credits available for each level of this scale.

Table 9: Reward Scale

Reward Scale*	Additional Requirements
Minimising Loss	A suitably qualified ecologist must confirm that it is not practically feasible to achieve the No Net Loss requirements AND There are no residual impacts on protected sites or irreplaceable habitats.
No Net Loss	If there is no impact on area or linear habitats at all, then the total area of habitat created should cover at least 2.5% of the Development Footprint and a length of linear habitat should be created. AND There are no residual impacts on protected sites or irreplaceable habitats.
Net Gain	If there is no impact on area or linear habitats at all, then the total area of habitat created should cover at least 5% of the Development Footprint and a length of linear habitat should be created. AND There are no residual impacts on protected sites or irreplaceable habitats.
Significant Net Gain	There are no residual impacts on protected sites or irreplaceable habitats

* The number of credits/points assigned to each reward level may vary depending on the scheme. See the relevant scheme technical manual for the number of credits available.

Designated sites, and/or irreplaceable habitats and the Mitigation Hierarchy

Biodiversity in designated sites and irreplaceable habitats is legally protected and its protection is covered by statutory requirements and procedures. The BREEAM family of certification schemes recognise steps taken that go beyond these regulatory requirements and as such BREEAM, CEEQUAL and HQM credits/points for this methodology can only be gained in relation to biodiversity that does not form part of a designated site or irreplaceable habitat or form part of the mitigation or compensation identified for these sites.

Whilst impacts on designated sites and irreplaceable habitats must be dealt with separately, credits/points cannot be gained unless it is demonstrated that all requirements of the environmental legislation and national policy are met by the project. The Assessor will need to seek confirmation that the mitigation hierarchy has been followed and that the appropriate avoidance, mitigation and/or compensation measures have been agreed with the relevant statutory bodies. Whilst habitat losses and gains relating to legally protected species should be included in the BREEAM assessment of change in ecological value, evidence that the appropriate avoidance, mitigation and/or compensation measures have been agreed with the relevant statutory bodies will also need to be provided.

The Mitigation Hierarchy

1. Avoidance - Measures taken to avoid creating impacts from the start. For example, changing the location of the development or development activities within the site to avoid habitats present on site.

2. Minimisation - Measures taken to reduce the duration, intensity, extent and/or likelihood of impacts that cannot be avoided, to a level that is no longer considered significant for the species or habitat feature.

3. Onsite compensation - Measures taken onsite, to provide a biodiversity contribution that is proportionate to the long term loss for residual impacts that cannot be completely avoided or minimised.

4. Offsite compensation / offset - Measures taken offsite to provide a biodiversity contribution that is proportionate to the long term loss for any residual, adverse impacts onsite after full implementation of the previous three measures.

For further information please see the Business and Biodiversity Offsetting Programme at http://bbop.forest-trends.org/pages/mitigation_hierarchy

Appendix A: Definitions

Term	Definition
Area based habitat	Any habitat that is assessed based on its area rather than its length. All habitats other than those listed in the Linear habitat definition fall into this category.
Area based biodiversity unit	A nominal figure that is derived from a calculation using numerical values assigned for the distinctiveness, condition and area of a habitat and associated risk factors. Biodiversity Units are not a full representation of ecological value, but are used to provide a quantification of a loss of biodiversity, no net loss or a net gain in biodiversity as a result of development.
Delivery risk	Delivery risk is the risk associated with the difficulty to create or enhance any specific habitat. Appendix 1 of Defra's Technical Paper (2012 a) provides an indicative guide to broad categories of risk for different habitats. For habitat types not listed in Defra's guidance or Appendix C - Habitat Classification and Reference Index, the applied delivery risk factor should be one for similar habitat types defined by Defra and be fully justified by the SQE.
Development footprint	The development footprint consists of the site, considered to be the land enclosed by the boundary of the BREEAM assessment, and includes any land used for buildings, hardstanding, landscaping, site access or where construction work is carried out (or land being disturbed in any other way). It also includes any areas used for temporary site storage and buildings. If it is not known exactly where buildings, hardstanding, site access, temporary storage and buildings will be located, it must be assumed that the development footprint is the entire development site. For the purpose of the Change in Ecological Value calculation this area will also include any land outside the development boundary where: - there is an indirect impact on biodiversity, including but not limited to the zone of Influence, and - land being used to compensate for impacts, either on the site or outside it as a biodiversity offset.
Green roof - Extensive green roofs	Extensive green roofs generally provide greater biodiversity interest than intensive roofs, but are considered to be less appropriate in providing amenity and recreation benefits. In most cases they are planted with, or colonised by, mosses, succulents, wild flowers and grasses that are able to survive on the shallow low-nutrient substrates that form their growing medium. (Greater London Authority, 2008)
Green roof - Intensive green roofs	Intensive green roofs are principally designed to provide amenity and are normally accessible for recreational use. They may be referred to as roof gardens or terraces. Generally intensive green roofs comprise a lush growth of vegetation and are based on a relatively nutrient rich and deep substrate. They allow for the establishment of large plants and conventional lawns. (Greater London Authority, 2008).
Habitat condition	Condition is defined as the quality of a particular habitat. For example, a habitat is in poor condition if it fails to support the rare or notable species for which it is valued, or if it is degraded as a result of pollution, erosion, invasive species or other factors. The methodology (mirroring Defra's metric) requires habitat condition to be assessed using the system presented in Natural England's Farm Environment Plan (FEP) manual.
Habitat creation	The removal or the loss of the present habitat in the action of creating the new one or creating habitat where none was previously present (including bare earth). This includes, for example, removing scrub in order to create a wetland habitat or removing hardstanding to create new grassland habitat.
Habitat distinctiveness	Habitat distinctiveness is a measure of biodiversity that has regard for the number and variety of species found there (richness and diversity), how rare the species are, and how many species the habitat supports that are not common elsewhere. Habitat distinctiveness is scored against a three category scale (high, medium and low). Broadly, all Habitats of Principal Importance (HPI) will be assigned high distinctiveness, other habitats which are not HPI quality will be assigned medium distinctiveness and any habitats which have been intensively managed such as improved grassland or arable pasture will be assigned low distinctiveness.
Habitat enhancement	The improvement of the condition of an existing habitat, thereby increasing the biodiversity value of a habitat type. Enhancement is achieved through measures that improve habitat biodiversity capacity and/or remove factors that detract from its value. This includes increasing the diversity of species that can be supported by a habitat, for example by managing improved grassland so that it becomes semi improved grassland, which would seek to increase species diversity.

Habitats and species of principal importance (HPIs)	Habitats of Principal Importance (or priority habitats) and species of principal importance (or priority species) are those identified as being of principal importance for biodiversity in accordance with the Natural Environment and Rural Communities Act (2006). These habitat types are also often referred to as 'priority habitats' and for the purposes of this methodology, will always be habitats with a 'high distinctiveness' attribute.
	Arable field margins specifically managed for wildlife also qualify as a Habitat of Principal Importance.
Legally protected species, designated sites and irreplaceable habitats	Legally protected species are the European Protected Species listed in Annex IV of the European Habitats Directive and those protected under The Wildlife & Countryside Act (1981).
	Designated sites are SSSIs (Sites of Special Scientific Interest), ASSIs (Areas of Special Scientific Interest (Northern Ireland), SACs (Special Areas of Conservation), SPAs (Special Protection Areas) and Ramsar Sites.
	Irreplaceable habitats includes ancient woodland defined in DCLG 2012 and Forestry Commission and Natural England, 2018.
	The draft NPPF (2018) provides the following definition: those which could be described as irreplaceable due to the technical difficulty or significant timescale required for replacement. It includes ancient woodland, blanket bog, limestone pavement and some types of sand dune, saltmarsh, reedbed and heathland.
Linear habitat	Hedgerows, lines of trees (where not part of a continuous hedge), watercourses, ecologically important ditches. Green walls consisting of climbing plants where the wall is simply acting as a support for the plants should be treated as Linear Habitats.
Linear biodiversity unit	A nominal figure that is derived from a calculation using numerical values assigned for condition and length of a linear habitat. Distinctiveness of Linear Habitats is not calculated as most linear features will be Habitats of Principal Importance (HPI).
Local biodiversity priorities	Local (county or equivalent) biodiversity, green infrastructure or offsetting strategies. For example, local Biodiversity Action Plans (BAPs) or Biodiversity Opportunity Areas (BOAs).
Low impact developments	For the purposes of BREEAM these are defined as those that meet both of the two following criteria:
	- Area: the total area of all habitats (excluding Linear Habitats) within the Development Footprint is less than 0.05 ha (500m^2).
	- Distinctiveness: the Area Based Habitats (i.e. those habitats that are not always linear in nature such as hedgerows) are medium or low categories of distinctiveness.
	Note: The simplified approach can be used when Linear Habitats are present, regardless of their distinctiveness. The full calculation approach must be used for all other projects.
Risk factors	Risk factors are used in the Post Development Biodiversity Unit calculation to account for main risks in delivering biodiversity gains. These do not cover all eventualities but provide a numerical value for the most likely risks. These are spatial risk, temporal risk and delivery risk. Risk factors are assigned to each risk in the BREEAM Ecological Metric to be applied to the Post Development Biodiversity Unit calculation.
	It should be noted risk factors only apply to Area Based Habitats as risks associated with creating linear features are taken into account within the condition multiplier.
Spatial risk	Spatial risk is the risk associated with delivering compensation for the loss of a habitat at a distance from that loss. In general the greater distance from the original habitat can mean a greater risk, especially in relation to areas of strategic priority for biodiversity.
Temporal risk	Temporal risk is the time required for the new habitat to reach the required quality or level of maturity. This is a combination of:
	1. The time the habitat takes to enhance or create; and
	2. The time gap between the habitat loss and the start of the creation or enhancement of a new habitat.
Web based maps	Web based maps should be from a robust source (government, NGO, etc.) and be up-to-date. For example MAGIC (http://magic.defra.gov.uk/)
Zone of influence	Areas of land or water bodies impacted by the site undergoing assessment. These areas can be adjacent to the site or can be areas that are dependent on the site but not physically linked including areas downstream from a site. Areas within the zone of influence can be negatively affected by changes on an assessment site but they also provide further opportunity to maximise enhancement activities.

Appendix B: Habitat Classification and Survey Methodology

Habitats should be classified into Phase 1 habitat categories following the methodology set out by JNCC (2010) in the Handbook for Phase 1 habitat survey - a technique for environmental audit.

Phase 1 habitat types do not always identify all Habitats of Principal Importance. Additional field notes should be taken to identify these habitats, using the JNCC (2011) definitions if needed. Please see the section below on Habitats of Principal Importance for further information.

The condition of the habitats should be assessed using the methodology set out in the Farm Environment Plan (FEP) Manual (Natural England 2010). If the habitat is not covered within the FEP Manual, the table in section 5.3 should be used to assign habitat condition.

If another methodology is used to assess the condition of the habitats the use of the chosen methodology should be justified within the ecological assessment report.

Urban Habitats

To supplement the Phase 1 habitats, additional habitats have been defined within this technical note to better address urban areas. These are listed in Appendix C and further information on the typologies of green roofs and walls can be found in Living Roofs and Walls (Greater London Authority 2008).

It is acknowledged that Phase 1 surveys will not always be possible, for example, due to lack of access to parcels of land. Where this is the case, and other means of classifying habitats are used, the inability to access the land should be justified and the alternative means of identification of habitats, such as the use of existing data from Local Record Centres or aerial photography, should be stated and justified.

Phase 1 surveys may not be required where all the habitats present within the development parcel are of low distinctiveness (irrespective of the area). In this case a site walk over should be undertaken following the guidelines set out by CIEEM for Preliminary Ecological Appraisal (CIEEM, 2018).

Where a Phase 1 survey or walk over are not possible the habitats should be identified based on the best available information (e.g. aerial photography).

Where a FEP condition assessment is not possible and the condition cannot be based on local relevant data (such as surveys on other areas within the Development Footprint) the condition of the habitats should be assumed to be of moderate condition unless there is other evidence that the habitat is likely to be of high condition, such as recent records of the presence of species of principal importance.

All habitats within the Development Footprint should be recorded including the areas not affected or those that are temporarily affected, indirectly affected and any existing habitats present at offsite compensation sites. This includes areas of hard standing and buildings that will be assigned zero values for their distinctiveness and condition – remembering that Biodiversity Unit scores are reported for each feature. Where indirect effects are identified, these should be included in the calculation, with justifications provided for the Pre and Post Development Biodiversity Unit and Linear Unit scores assigned.

Habitats of Principal Importance (or Priority Habitats)

Certain habitat types have been identified as being of principal importance for biodiversity in accordance with the Natural Environment and Rural Communities Act 2006. These habitat types are also often referred to as 'priority habitats' and for the purposes of this metric, will always be assumed to be habitats with a 'high distinctiveness' attribute.

Additional survey information will be needed alongside the Phase 1 habitat classification for some habitat types, to clearly demonstrate that the appropriate distinctiveness score has been applied. Details of which habitats this applies to are provided in Appendix C.

For example, A1.1.2 Woodland: Broadleaved - plantation could be a native species plantation or a traditional orchard. The native species plantation is assigned a medium distinctiveness score while the traditional orchard is a Habitat of Principal Importance and so is assigned a high distinctiveness score.

Habitats of Principal Importance can also be identified using the data held on MAGIC (http://magic.defra.gov.uk/) and/or in the UK Biodiversity Action Plan Priority Habitat Descriptions (JNCC 2011 - http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc-Rev2011.pdf).

Arable Field Margins

Arable field margins specifically managed for wildlife are a habitat of principal importance. Where field survey or interpretation of aerial photographs identifies the presence of margins that may qualify, then a standard width of 10m should be used to provide an estimate of the number of Biodiversity Units that are contributed by such features (i.e. they are not treated as linear features in the Biodiversity Unit calculation).

Individual Trees and Lines of Trees

Individual trees and lines of trees that are not part of a continuous hedgerow should be treated in the same way as an area based habitat. For these trees, the Root Protection Area, identified through established methodologies (such as the British Standard BS 5837:2012 trees in relation to design, demolition and construction), should be used as an estimated area.

Linear Features

Hedgerows, watercourses, ecological important ditches and some green walls etc. (see the definition of Linear Habitats in Appendix A) should be considered as linear features and each will form a separate aspect of the Biodiversity Unit calculation.

These habitats should be mapped as a line rather than a polygon if using GIS. Linear Habitats will generate their own number of Biodiversity Units (termed Linear Units) Pre Development which equate to metres required in the Post-Development assessment.

Due to the unique nature of these habitats it will normally only be acceptable to offset unavoidable losses of this habitat through the provision of the same habitat type (i.e. loss of hedgerow should only be offset by creation of more hedgerows of a similar type).

Losses and gains will generate Linear Units based on the length of hedgerow or watercourses etc lost or gained. Linear Units are not described within the Defra metric but are used in BREEAM to provide clarity on the impacts of a development. The Linear Units gained from hedgerows and watercourses should be kept separate from one another and from the units generated from Area Based Habitats.

Watercourses and green walls are not well covered within the Farm Environment Plan Manual and as such the use of alternative methodologies is acceptable where they are appropriate. If another methodology is used to assess the condition of watercourses the use of the chosen methodology should be justified by the SQE within their reporting.

Green Roofs and Green Walls

To take account of green roofs and walls these habitats need to be identified by the SQE.

1. Green roofs should be separated into two categories; extensive and intensive. Either type of roof should be treated as an area based habitat.

The definitions of intensive and extensive green roofs are set out in Appendix A.

2. The SQE should also separate green walls into two categories, those that are plug planted and those that consist of climbing plants.

• Plug planted green walls should be treated as Area Based Habitats being aligned to the closest equivalent habitat type.

• Green walls consisting of climbing plants where the wall is simply acting as a support for the plants should be treated as Linear Habitats.

Appendix C: Habitat Type Classification and Reference Index

For some habitat types within the Phase 1 classification, multiple distinctiveness bands can apply, depending on the quality of the habitat. Appendix C details these habitat types and provides guidance on how to assign the appropriate distinctiveness band.

This information is held in a stand-alone Excel file with the same title as this section. The Excel file is available on the BREEAM website, in the Resources section, www.breeam.com/discover/resources.

Appendix D: References

External Documents that are referenced

All references to external documents are correct at the time of writing. The current version of these documents, at the time of assessment, should be used. The SQE should ensure that the current or alternative versions (where appropriate) are reviewed as applicable. This list is not a complete set of references.

If other documents/methodologies are used in place of those listed, then the SQE should make reference to these alternatives providing adequate evidence/reason as to why these are used in preference. Specifically, this could apply to the JNCC Handbook on Phase 1 habitat survey and the use of the Farm Environment Plan condition assessment methodology.

BSI (2012). BS 5837:2012 – Trees in relation to design, demolition and construction.

CIEEM, CIRIA & IEMA. (2016). Biodiversity Net Gain: Good practice principles for development. https://www.iema.net/assets/newbuild/documents/IEMA%20Biodiversity%20Net%20Gain.pdf

CIEEM (2017) Guidelines for Preliminary Ecological Appraisal (GPEA) https://www.cieem.net/guidance-on-preliminary-ecological-appraisal-gpea-

Department for Communities and Local Government (2012) National Planning Policy Framework https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

Natural Environment and Rural Community Act (2006) http://www.legislation.gov.uk/ukpga/2006/16/contents

Department for Environment, Food and Rural Affairs (Defra) (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf

Department for Environment, Food and Rural Affairs (Defra). (2012a) Technical Paper: the metric for the biodiversity offsetting pilot in England. https://www.gov.uk/government/publications/technical-paper-the-metric-for-the-biodiversity-offsetting-pilot-in-england

Department for Environment, Food and Rural Affairs (2012b) Biodiversity Offsetting Pilots: Guidance for offset providers. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69530/pb13742-bio-guide-offset-providers.pdf

Department for Environment, Food and Rural Affairs (2012c) Biodiversity Offsetting Pilots: Guidance for developers. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69528/pb13743-bio-guide-developers.pdf

Forestry Commission and Natural England (2018) Ancient woodland and veteran trees: protecting them from development https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences

Greater London Authority (2008) Living Roofs and Walls – Technical Report: Supporting London Plan Policy https://www.london.gov.uk/sites/default/files/living-roofs.pdf

JNCC (2011) UK Biodiversity Action Plan – Priority Habitat Descriptions. http://jncc.defra.gov.uk/PDF/UKBAP_PriorityHabitatDesc- Rev2011.pdf

JNCC (2010) Handbook for Phase 1 Habitat Survey: a Technique for Environmental Audit.

Natural England (2010) Higher Level Stewardship Farm Environment Plan (FEP) Manual Technical Guidance on the completion of the FEP and identification, condition assessment and recording of HLS FEP features. Third Edition. Natural England. Peterborough. http://webarchive.nationalarchives.gov.uk/20150303063952/http://publications.naturalengland.org.uk/publication/32037

BRE Global
Bucknalls Lane
Watford
United Kingdom
WD25 9XX

T +44 (0)333 321 8811
E breeam@bre.co.uk
www.breeam.com