Hilfield Solar Farm and Battery Storage

Biodiversity Net Gain Report

on behalf of Elstree Green Limited

Prepared by BSG Ecology | December 2020 | Document Reference: R013

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Biodiversity Net Gain Assessment

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Disclaimer

Contents

1 Introduction

Background to commission

1.1 Elstree Green Limited is applying for planning permission for a solar farm and battery storage development ("the Proposed Development") on land to the north east and west of Elstree Aerodrome, Hertfordshire.

1.2 BSG Ecology was commissioned in March 2020 to undertake an Ecological Impact Assessment of the proposed solar farm development, including a biodiversity net gain calculation using the Defra Metric 2.0 Net Gain calculator.

1.3 This report provides details of the Defra Metric 2.0 Net Gain calculator results to support the Ecological Impact Assessment. This was undertaken to ensure that the proposed development provides a net gain in biodiversity, in line with national and local planning policy.

Site description

1.4 The 'Site' is approximately 130.6 ha in total area and predominantly consists of arable land with large fields in intensive agricultural production with some areas of species-poor neutral grassland used for horse grazing and forming field margins in some areas. The crops are mainly cereals with some oilseed rape. These fields are separated by established and in some cases large and overgrown hedgerows with large mature trees.

1.5 Small woodland parcels and some scrub are present on the Site, with further woodland are present immediately adjacent to the Site. Watercourses (ditches and streams) running through and adjacent to the Site and five ponds are present. The area surrounding the Site is largely further arable land of a very similar nature to that present within the Site.

1.6 The Site is divided into a western parcel of land (48.1 ha centred approximately at OS National Grid Reference TQ15129653) and an eastern parcel (82.4 ha in extent and centred approximately at TQ16619744). The boundary of 'the Site', is shown on Figure 1 of the main report (an additional area, the "airport parcel" is not covered here as no permanent alterations to habitats are proposed there).

The Policy and Legislation background

National Planning Policy

1.7 Existing Government policy for England on biodiversity net gain is set out in the National Planning Policy Framework (NPPF, 2019). The following paragraphs apply:

- Paragraph 8: "Achieving sustainable development... (so that opportunities can be taken to secure net gains across each of the different objectives)..."
- Paragraph 170: "Planning policies and decisions should contribute to and enhance the natural and local environment by… minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures…"
- Paragraph 174b: "To protect and enhance biodiversity and geodiversity, plans should…promote the conservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity."
- Paragraph 175d: "…when determining planning applications…opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity."

1.8 Biodiversity net gain is also reflected within the Government's 25 Year Plan to Improve the Environment:

Policy 1 '*Embedding an 'environmental net gain' principle for development, including housing and infrastructure*.' '*Current policy is that the planning system should provide biodiversity net gains where possible. We will explore strengthening this requirement for planning authorities to ensure environmental net gains across their areas, and will consult on making this mandatory*.'

1.9 The Defra Biodiversity Metric 2.0 is considered to be the emerging 'national standard' and is therefore appropriate to apply to the Site. There is no existing locally derived biodiversity metric that can be applied.

1.10 Defra issued their revised method for calculating the net change in biodiversity (Defra Biodiversity Metric 2.0) in July 2019 along with guidance for developers and the ecology profession (Crosher, 2019) on how to apply it. Minor bug-fixes and an updating of the function of the connectivity tool were made in December 2019.

Local Planning Policy

1.11 The Hertsmere District Council Core Strategy Policy CS12 (The Enhancement of the Natural Environment) states:

1.12 *"All development proposals must conserve and enhance the natural environment of the Borough, including biodiversity, habitats, protected trees, landscape character, and sites of ecological and geological value, in order to maintain and improve environmental quality, and contribute to the objectives of the adopted Greenways Strategy and the Hertsmere Green Infrastructure Plan. Proposals should provide opportunities for habitat creation and enhancement throughout the life of a development. In the case of the highest quality agricultural land (Grades 1, 2 and 3a) and Preferred Areas of mineral extraction, proposals will only be permitted where there is no likelihood of the land being sterilised for future agriculture or mineral extraction."*

Proposed mandatory biodiversity net gain legislation

1.13 The Government signalled its intention to make biodiversity net gain mandatory in England in the Queen's Speech of December 2019 that referred to the introduction of the Environment Bill. The speech stated that one of its elements would be:

"Protecting nature by mandating 'biodiversity net gain' into the planning system, ensuring new houses aren't built at the expense of nature and delivering thriving natural spaces for communities."

1.14 That Bill received its First Reading in the House of Commons on 30 January 2020. The key measures of that proposed legislation relating to biodiversity net gain are (as itemised in draft Schedule 14):

- The submission by the developer of a 'biodiversity gain plan'.
- Achievement of a biodiversity net gain of 10%.
- Application of a biodiversity metric produced and published by the Secretary of State.
- Fixing the pre-development biodiversity value to a pre-determined reference date of 30 January 2020.
- Maintenance of the biodiversity enhancements for at least 30 years after the development is completed.

2 Defra Biodiversity Metric 2.0 Methods and Inputs

2.1 In order to demonstrate measurable biodiversity net gain, the Defra Biodiversity Metric 2.0 has been used to calculate the biodiversity value of the Site both for the existing Site baseline conditions and for the post-development landscaping scenario. The metric uses habitat features as a proxy measure for capturing the value and importance of biodiversity. The metric calculates the biodiversity value of a site before and after development based on habitat features and accounting for their size, ecological condition, location and proximity to nearby 'connecting' features.

2.2 The biodiversity net gain assessment method is based on the information contained in the User Guide that accompanies the Defra Biodiversity Metric 2.0 (Crosher *et al*., 2019a).

2.3 The calculations of biodiversity value have been carried out using the Defra Biodiversity Metric 2.0 biodiversity calculator spreadsheet (accessed from http://publications.naturalengland.org.uk/publication/5850908674228224).

2.4 The method used is summarised as a series of stages as follows and is set out in more detail in the subsequent paragraphs:

- Stage 1: Desk study and field survey to identify and quantify the habitats.
- Stage 2: Desk based evaluation of the habitat 'classification' and 'condition'.
- Stage 3: Calculation of the pre- and post-development biodiversity value of the Site and the net change in biodiversity value using the Defra Biodiversity Metric 2.0.

Stage 1: Desk based study and field survey

2.5 A desk study and a Phase 1 habitat survey of the Site were undertaken and the method, evaluation and results are reported in the Ecological Appraisal (Document Ref: R12) accompanying the planning application.

2.6 The Phase 1 habitat survey followed the method described in JNCC (2010) to map and record the habitat types using standard notation for a Phase 1 habitat survey. Dominant plant species and information on land management practices were recorded for each habitat parcel. This information has subsequently been used to inform the assessments of the condition of the habitats present (see Stage 2). Figure 2 shows the Phase 1 habitat types recorded on Site, it also shows off-site habitats (within the "substation" and "airport" parcels) but these are not included within the calculations since they are outside the Site.

2.7 The Phase 1 habitat survey was digitised and the areas of habitats and lengths of linear features were measured using Arc GIS software produced by Esri-UK.

Stage 2: Desk based evaluation of the habitat 'classification' and 'condition'

Habitat classification

2.8 Phase 1 habitat categories at the Site were converted into corresponding UK Habitats categories. This conversion was based on both the conversion table provided in the biodiversity calculator spreadsheet, and using the UK Habitat Classification definitions (UK Habitat Classification Working Group, 2018). The main results table shows both the Phase 1 habitat categories and the corresponding UK Habitat Classification categories.

Condition Assessment

2.1 The condition of the pre-development habitats was assessed based on the technical guidance that accompanies the Defra Biodiversity Metric 2.0 (Crosher *et. al*., 2019b).

Stage 3: Biodiversity net gain calculation

Calculation of pre-development ecological value

2.9 Habitat areas and lengths and habitat condition are used as inputs in the biodiversity calculator spreadsheet. The calculator then outputs the pre-development biodiversity value of the Site expressed in Defra Biodiversity Units (BUs).

2.10 The Biodiversity calculator spreadsheet takes into account of the following:

- Habitat Distinctiveness Score: An automatic ranking of the habitat based on a combination of its listed conservation status and its value to wildlife as a habitat (expressed as very high, high, medium, low or very low).
- Habitat Condition Score: A score (as per Table 1) is automatically attributed to the inputted Condition.

Table 1: Condition score

Description of condition	Metric score
N/A	0
Poor	1
Fairly Poor	1.5
Moderate	2
Fairly Good	2.5
Good	3

- Extent: The area or length of the habitat.
- Connectivity: The relationship of a particular habitat patch to other surrounding similar or related semi-natural habitats.
- Strategic Significance: Whether the habitat is located in a preferred location for local biodiversity and environmental objectives, such as Nature Recovery Areas or areas identified in local Biodiversity Action Plans.

Calculation of post-development ecological value

2.2 The proposed post-development land uses were obtained from the Landscape and Ecological Management Plan (LEMP) that accompanies the planning application. An appropriate habitat category from the UK Habitats Classification was chosen for each land use, as was an appropriate and achievable target condition for these habitats. This information was entered into the habitat creation and habitat enhancement tables within the spreadsheet.

2.3 The spreadsheet applies factors that account for the difficulty of achieving that habitat, for the time that it might take and the target habitat condition. As for the pre-development habitat scoring, the formulae also account for habitat distinctiveness, extent and connectivity.

Calculation of the difference – the net value

2.11 The 'total net unit change' in biodiversity value (net gain or loss) is automatically calculated by subtracting the Site's pre-development value in BUs from the post-development value (i.e. the sum of the values for the retained, created and enhanced habitats on the Site). A net percentage change from the baseline is then automatically calculated.

2.12 Net changes in area habitats, hedgerow habitats and river habitats are calculated separately are reported separately in the spreadsheet.

Assumptions and limitations

2.13 The net gain assessment is based on habitats only and it does not take account of any required species actions, such as those for legally protected species. The actions identified in the main report for the Site in relation to legally protected species remain relevant. The habitat types proposed within this report have taken in to account any ecology mitigation measures detailed in the main report.

2.14 The assessment does not give credit (in terms of a score or biodiversity units) to any actions that are taken as part of the development that add particular features to the Site, such as the provision of bird nesting boxes, that enhance the potential of the Site to support particular species. Such measures fall outside the scope of the metric.

2.4 The naming of natural and man-made features can differ between this document and the names used in the main report and in the application documents prepared by other technical specialists.

Calculator Inputs

2.5 Tables 2 and 3 on the following pages set out the key inputs used in the calculation. Table 2 sets out habitat type, area and condition for current habitats and Table 3 sets out habitat type, area and condition for the proposed future habitats, based on the LEMP (Document Ref: R009).

2.6 All rivers are being retained in the Proposed Development, with appropriate buffer areas and protective measures during construction, and appropriate ongoing conservation management thereafter. Therefore, there will be no loss in the length and condition of these habitats, and taking a proportionate approach to assessment, they have not been included in the biodiversity calculation.

2.7 Results

Table 2: Baseline habitats types and conditions

Habitat		Area (ha)	Justification for habitat type	Habitat Condition	Justification for Habitat Condition (with reference to Crosher et al, 2019)
Phase 1	**UK Habitat Classification**				
Arable	Cropland - Cereal crops	105.75	Regularly ploughed arable land for crop production	N/A – Agriculture	N/A – no assessment required
Poor semi-improved grassland	Grassland - Modified grassland	11.09	Horse grazing paddock in eastern parcel: dominated by a few fast growing grasses notably false oat grass *Arrhenatherum elatius,* with some tufted hairgrass *Deschampsia cespitosa* and soft rush *Juncus effusus* Few other forb species noted within the sward, the majority of which were species indicative of high nutrient input, and/or undesirable species such as creeping thistle *Cirsium arvense* and common ragwort *Senecio jacobaea*.	Fairly Poor	Most of the condition criteria are failed (1, 2, 3 and 4 are failed) and the sward is dominated by a few grass species, typical of fertile soils. This area was noted as having significant areas of undesirable species within the sward (predominantly creeping thistle and common ragwort). This habitat is therefore not in good or moderate condition. However, cover of perennial rye-grass *Lolium perenne* was lower than 25%, cover of scrub was less than 5%, and the sward and species mix is not indicative of intense fertiliser input. Some areas were slightly more diverse. This area has therefore been identified as fairly-poor condition, rather than poor condition. 6.57 ha of this field will be retained and enhanced to neutral grassland. The remainder will be retained as modified grassland as part of the solar arrays.
		1.33	Field margins and areas around Ponds 2 and 4 in the eastern parcel: dominated by a few fast growing grasses notably false oat grass *Arrhenatherum elatius,* cock's foot *Dactylis glomerata* ad Yorkshire fog *Holcus lanatus.* Minimal cover of forbs.	Moderate	Most of the condition criteria are failed (1, 2, 3 and 4 are failed) whilst the sward is dominated by a few grass species on fertile soils. These areas are therefore not in good condition. However, cover of perennial rye-grass *Lolium perenne* was lower than 25% and other indicators of Poor condition (e.g. extensive bare ground, mechanical damage, scrub cover) were not present. These areas are therefore identified as Moderate condition.
Dense scrub	Heathland and	8.55	Areas dominated by woody	Moderate	Some of the condition criteria (i.e. 1, 4 and 5) are failed on all scrub

Habitat		Area (ha)	Justification for habitat type	Habitat Condition	Justification for Habitat Condition (with reference to Crosher et al, 2019)
Phase 1	**UK Habitat Classification**				
	shrub - mixed shrub		vegetation up to 5 m in height, including stands of blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna* and/or bramble *Rubus fructicosus* agg.		within the Site. All scrub patches contain fewer than three woody species, or are dominated by >75% cover of one woody species (generally blackthorn or bramble). Scrub is generally surrounded by grazed land and for the most part well-developed edges of ungrazed tall herbs are not present. Clearings and glades are generally absent. Scrub onsite is therefore not in good condition. However pernicious weeds and invasive species are predominantly absent (<5% of ground cover) and in places the scrub shows some age structure with saplings and mature stands both present. This condition is therefore moderate. All of this habitat will be retained.
Broadleaved semi-natural woodland	Woodland – lowland mixed deciduous woodland	0.75	Areas with tree cover in southern tip of western parcel and around some ponds	Moderate	Two of the condition criteria are failed for all woodland on Site: there is a lack of standing and fallen deadwood (criterion 6) and a diverse age structure is missing (areas around the ponds comprise mostly mature or senescent trees while the woodland at the southern tip of the western parcel comprises only young trees. These areas are therefore not in Good condition. However there is no evidence of inappropriate management, significant nutrient enrichment, damage to channels of watercourses or herbivore damage, and no invasive species were noted. The woodlands do not show obvious evidence of recent planting. Therefore, this habitat is in Moderate condition. All of this habitat will be retained.
Bare ground	Urban - Artificial unvegetated, unsealed surface	0.21	Small areas of compressed hardcore track within the western parcel.	N/A - Other	N/A – no assessment required
Tall ruderal	Sparsely vegetated land - Ruderal/	0.21	Bank along north western boundary of horse paddock in	Poor	Identified as poor condition due to dominance of pernicious species.

Habitat		Area (ha)	Justification for habitat type	Habitat Condition	Justification for Habitat Condition (with reference to Crosher et al, 2019)
Phase 1	**UK Habitat Classification**				
	Ephemeral		eastern parcel dominated by stinging nettle *Urtica dioica* and thistles *Cirsium* sp.		
Ponds	Lakes - Ponds (Priority Habitat)	0.058	Two of five ponds present (Ponds 2, 4) are clearly Habitats of Principal Importance[1] due to the presence of great created newts *Triturus cristatus.*	Moderate	Both of these ponds fail a number of the condition criteria: Neither pond has a buffer of semi-riparian land for 10 m around them (criterion 2). Both ponds feature extensive duckweed (>10% cover). In both ponds water quality is poor with significant turbidity and both ponds are likely to be heavily influenced by agricultural runoff. These ponds are therefore not in Good condition. However, both ponds are fishless and not artificially connected to other waterbodies. Water levels are free to fluctuate naturally, no non-native species are present, and a good cover of submerged, floating and emergent plants (apart from duckweed) is present in all ponds. These ponds therefore do not fail a majority of condition criteria and are considered to be in Moderate condition.
		0.0356	The remaining three ponds (Ponds 1, 3 and 5) have potential to be HPIs (for example based on macrophyte or invertebrate diversity) and have therefore, on a precautionary basis, been assumed to be HPIs in this calculation.	Moderate	All of these three ponds fail a number of the condition criteria: Ponds 1, 3 and 5 do not have a buffer of semi-riparian land for 10 m around them (criterion 2). Ponds 3 and 5 are dominated by duckweed (criteria 3 and 9). Ponds 1 and 5 are heavily shaded. All three ponds have limited water quality (some turbidity) and are likely to be heavily influenced by agricultural runoff. These ponds are therefore not in Good condition. However, all ponds appear to be fishless and are not artificially connected to other waterbodies. Water levels are free to fluctuate naturally, no non-native species are present, and some cover of submerged, floating and emergent plants (apart from duckweed) is present in all ponds. These ponds therefore do not fail a majority of condition criteria and are considered to be in Moderate condition.
Dry Ditch	Lakes – ditches	0.013	Man-made drainages ditches around fields, predominantly in	Poor	All ditches on site were dry or largely dry with no aquatic vegetation present and directly adjoin an intensive land use (arable land). This

[1] As listed by Natural England in accordance with Section 41 of the Natural Environment and Rural Communities Act 2006.

Habitat		Area (ha)	Justification for habitat type	Habitat Condition	Justification for Habitat Condition (with reference to Crosher et al, 2019)
Phase 1	**UK Habitat Classification**				
			eastern parcel		puts them in Poor condition.

Table 3: Future habitat types and conditions

Habitat shown on LEMP	UK Habitat Classification	Area (ha)	Target Condition	Justification for achievement of condition and habitat type
Neutral grassland (within security fencing)	Modified grassland	75.07	Low	To be created within current arable fields. For the area of grassland around and under the solar arrays, the development will aim to reach as high a condition level as possible, through seeding with a wildflower seed mix and through subsequent management being low intensity grazing. However, a precautionary habitat type of modified grassland and target condition of poor has been used for this habitat in the calculation in order to avoid overestimating the future habitat value.
Tussocky grassland with wildflowers	Grassland - Other neutral grassland	16.43	Moderate	Areas around the field margins will be sown to with neutral grassland and wildflowers, with any current grassy margin retained. Management will be by an annual cut in late summer. Achieving a moderate target condition (i.e. more than 9 species per m^2 and lower percentage of perennial rye grass coverage, less than 25%), is realistic and has been assumed in the calculation.
Hilfield Brook green wedge (Tussocky grassland with wildflowers)	Grassland - Other neutral grassland	5.99	Moderate	This area in the west of the Site will be created from arable land by planting neutral grassland and wildflowers. This will achieve a moderate target condition with a suitable seed mix and annual management. A higher species diversity of grasses and wildflowers (more than 9 species per m2 and lower percentage of perennial rye grass coverage, less than 25%), will therefore be achieved.
Parkland	Woodland and forest - Wood-pasture and parkland	2.90	Poor	This are will be created from arable land through seeding with a diverse native seed mix and managed with grazing, and planted with scattered trees. It is hoped that moderate habitat condition can be achieved, and the LEMP sets out appropriate management for this, but a poor condition is targeted on a precautionary basis, in order to avoid over-estimating the future habitat value.
New structure planting and boundary hedgerow enhancement	Heathland and shrub - Mixed scrub	3.13	Moderate	Scrub will be planted in screening locations around the boundaries of the Site. Planting will ensure a diverse range of species and structural diversity is present to meet Moderate condition for this habitat.
Solar farm	Urban –	1.90	N/A - Other	Areas of hardstanding and buildings and access tracks with gravel sub-base layer.

Habitat shown on LEMP	UK Habitat Classification	Area (ha)	Target Condition	Justification for achievement of condition and habitat type
infrastructure	Developed land, sealed surface			
Orchard	Traditional orchard	0.71	Moderate	An area of orchard will be planted on an area in the north of the eastern parcel. This will have fruit and nut trees surrounded by grassland under low intensity management. It is considered realistic for the management set out in the LEMP to achieve a moderate target condition.

Table 4: Habitat types and conditions to be retained and enhanced.

LEMP habitat	UK Habitat -Classifications	Area (ha)	Target Condition	Justification for achievement of condition and habitat type
Low intervention and skylark habitat enhancement area	Grassland - Other neutral grassland	6.43	Moderate	Part of the poor-semi improved grassland (modified grassland) in a horse paddock within the eastern parcel of the Site is being retained as rough grassland and enhanced as mitigation for breeding skylark. This will achieve a moderate target condition with preparatory work (scarifying), addition of a suitable seed mix and annual management. A higher species diversity of grasses and wildflowers (more than 9 species per m^2 and lower percentage of perennial rye grass coverage, less than 25%), will therefore be achieved. Species likely to dominate the sward will be more indicative of neutral grassland according to the UK habitat classification. 0.14 ha of structure planting will be provided on parts of the edge of the skylark mitigation area, and this is counted towards the new structure planting in the previous table and have been subtracted from the grassland habitat enhancement figure.
Tussocky grassland with wildflowers (within the Aldenham Brook Green Corridor and linkages)	Grassland - Other neutral grassland	1.06	Moderate	Part of the poor-semi improved grassland (modified grassland) which forms existing field margins around the Aldenham Brook and Ponds 2–4 will be retained and enhanced as part of the total provision of “tussocky grassland with wildflowers” This will achieve a moderate target condition with preparatory work (scarifying), addition of a suitable seed mix and annual management. A higher species diversity of grasses and wildflowers (more than 9 species per m^2 and lower percentage of perennial rye grass coverage, less than 25%), will therefore be achieved. Species likely to dominate the sward will be more indicative of neutral grassland according to the UK habitat classification.

LEMP habitat	UK Habitat -Classifications	Area (ha)	Target Condition	Justification for achievement of condition and habitat type
Ponds	Lakes - Ponds (Priority Habitat)	0.058	Good	Existing ponds with great crested newt to be enhanced during winter months (while newts are hibernating out of the pond) by excavation to remove silt and the encroaching emergent plants (particularly dominant stands of reedmace *Typha latifolia*). This, combined with the change of landuse and resulting reduction in nutrient input, and the increase in semi-natural riparian vegetation due to grassland planting, is likely to enhance these ponds to Good condition.

Table 5: Baseline Hedgerow types and conditions in relation to UK Habitat Classifications and the DEFRA metric 2.0

Hedgerow Classification	Length (km)	Justification for hedgerow type	Hedgerow Condition	Justification for Hedgerow Condition
Native species rich hedgerow with trees	2.62	This habitat has an average of greater than 5 woody species per 30 m and has predominantly (over 80% cover) UK native woody species. It has associated mature trees.	Moderate	This habitat meets most of the attributes of a hedgerow in good condition (over 1.5 m high, over 1.5 m wide, no undesirable perennial species, no invasive non-native species, and no obvious damage by human activities). However, these hedgerows generally do not meet the attributes (B1 and B2) for 'non-gappy' hedgerows (i.e. they have gaps of over 10 % of its historic length in both the canopy and the base). They therefore fails both attributes in one functional group. These hedgerows were identified as being in "moderate" condition overall. All these hedgerows are to be retained.
Native hedgerow with trees	3.43	This habitat has an average of less than 5 woody species per 30 m and has predominantly (over 80% cover) UK native woody species. It has associated mature trees.	Moderate	This habitat meets most of the attributes of a hedgerow in good condition (over 1.5 m high, over 1.5 m wide, no undesirable perennial species, no invasive non-native species, and no obvious damage by human activities). However, these hedgerows generally do not meet the attributes (B1 and B2) for 'non-gappy' hedgerows (i.e. they have gaps of over 10 % of its historic length in both the canopy and the base). They therefore fails both attributes in one functional group. These hedgerows were identified as being in "moderate" condition overall.
Native species rich hedgerow	0.18	This habitat has an average of greater than 5 woody species per 30 m and has predominantly (over 80% cover) UK native woody species. It does not have associated	Good	The single length of hedgerow in this category meets all the condition criteria and is considered to be in good condition. All these hedgerows are to be retained.

Hedgerow Classification	Length (km)	Justification for hedgerow type	Hedgerow Condition	Justification for Hedgerow Condition
		mature trees.		
	0.47	This habitat has an average of greater than 5 woody species per 30 m and has predominantly (over 80% cover) UK native woody species. It does not have associated mature trees.	Poor	These hedgerows are defunct and considered to be in poor condition, as they fail the gappiness attributes (B1 and B2) and the height and width attributes (A1 and A2). All these hedgerows are to be retained.
Native Hedgerow	5.24	This habitat has an average of less than 5 woody species per 30 m and has predominantly (over 80% cover) UK native woody species. It does not have associated mature trees.	Moderate	This habitat meets most of the attributes of a hedgerow in good condition (over 1.5 m high, over 1.5 m wide, no undesirable perennial species, no invasive non-native species, and no obvious damage by human activities). However, these hedgerows generally do not meet the attributes (B1 and B2) for 'non-gappy' hedgerows (i.e. they have gaps of over 10 % of its historic length in both the canopy and the base). It therefore fails both attributes in one functional group. These hedgerows were identified as being in "moderate" condition overall. All these hedgerows are to be retained.
	0.81	This habitat has an average of less than 5 woody species per 30 m and has predominantly (over 80% cover) UK native woody species. It does not have associated mature trees.	Poor	These hedgerows are defunct and considered to be in poor condition, as they fail the gappiness attributes (B1 and B2) and the height and width attributes (A1 and A2). All these hedgerows are to be retained.

Table 6: Hedgerow types and conditions to be created in relation to UK Habitat Classifications and the DEFRA metric 2.0

Hedgerow	Length (km)	Target Condition	Justification for achievement of condition and habitat type
Native Species Rich Hedgerow	3.186	Moderate	Re-instatement of historic hedgerows and planting of new hedgerows for visual screening around fields across the Site. Native hedgerow will be planted with greater than an average of 5 woody plants per 30 m. The hedgerow will be subsequently managed to meet all of the attributes of hedgerow in good condition, however due to the proximity of footpaths and adjacent grazed areas (which may cause disturbance) or planted scrub areas (which may cause shading and make hedgerows difficult to manage) and to adopt a precautionary approach (to avoid overestimating the future habitat value) this calculation assumes Moderate rather than Good condition.

3 Results

3.1 The biodiversity calculation using the Defra Biodiversity Metric 2.0 yields the following key results:

- Existing habitat score: 329.53 credits
- Proposed score from habitat creation: 459.81 credits
- Biodiversity gain for habitats: 130.28 credits
- Difference (i.e. biodiversity gain or loss) for habitats: 39.54 % net gain.

3.2 The Defra Metric Biodiversity Calculator yields the following key results for hedgerows. Assuming the proposed target conditions are met:

- Existing hedgerow score: 67.47 credits
- Proposed score from hedgerow creation: 83.19 credits
- Biodiversity gain for hedgerows: 15.72 credits
- Difference (i.e. biodiversity gain or loss) for hedgerows: 23.30 % net gain.

3.3 The calculations provided an overall 39.54% net gain for habitat areas for the Site post development and 23.30 % net gain for hedgerows, which is in line with paragraph 170 of the NPPF and Local Planning policy. The proposed development will therefore not require off-site habitat creation to achieve biodiversity net gain.

4 References

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