Biodiversity Assessment – *Final report*

Plot adjacent to The Old Rectory, Potterhanworth

March 2024

Prepared by Ecologist Elizabeth BSc (Hons) on behalf of:

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Report Overview	
Scheme reference	Plot adjacent to The Old Rectory, Potterhanworth, Lincolnshire
Works description	Self-build dwelling on an existing residential plot
Revision	Version 1 (Final)
Issued	27.03.2024
Prepared by	Elizabeth Fenn BSc (Hons) – Ecologist
Reviewed by	Helen Archer BSc (Hons) MCIEEM – Principal Ecologist

EXECUTIVE SUMMARY

Archer Ecology Ltd was commissioned by Evans McDowall Architects to prepare a Biodiversity Assessment with respect to the proposed self-build construction in Lincolnshire. The application site lies within a principally semi-rural setting in the village of Potterhanworth in the North Kesteven district of Lincolnshire, at approximately 11km south-east of Lincoln city centre.

The application site comprises amenity grassland and hardstanding, flanked by hedgerows. This Biodiversity Assessment appraises the extent of habitat loss/modification required to facilitate the proposed self-build dwelling.

The Biodiversity Assessment involved a desk study and review of ecological data obtained during a site visit completed by Principal Ecologist Helen Archer BSc (Hons) MCIEEM and Ecologist Elizabeth Fenn BSc (Hons) of Archer Ecology Ltd on 8th September 2023. During the walkover, baseline data were recorded on the site's current habitat composition, condition, area and floral species, as well as the presence of any invasive non-native species, where observable.

The Statutory Biodiversity Metric Calculation Tool was used to generate a pre-works and post-works comparison of biodiversity units as a result of habitat loss/modifications incurred to enable the development. Provided that the proposed habitat creation measures are implemented, as described in report Section 1.3, the calculator has indicated a minor **GAIN** in habitat (area) biodiversity units of **+0.01 units (+1.36% change)** and a considerable **GAIN** in habitat (linear) biodiversity units amounting to **+0.42 units (+89.17% change)** post-works. This outcome assumes that areas of introduced habitats, including trees, have successfully established and that a plan of adequate, long-term management and monitoring is implemented to ensure longevity of up to 30 years. Whilst this outcome falls below the standard +10% biodiversity net gain requirements for most housing developments (as mandated within the Environment Act 2021), it is understood that self builds are presently exempt from the requirements of the Act. Subsequently, all compensatory units would be provided as a voluntary contribution to biodiversity.

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1.0　INTRODUCTION

1.1　Background

1.1.1　Archer Ecology Ltd was commissioned by Evans McDowall Architects to prepare a Biodiversity Assessment with respect to a proposed self-build dwelling within an existing residential plot. The application site lies within a principally rural setting in the village of Potterhanworth. The site lies within the North Kesteven district of Lincolnshire, at approximately 11km south-east of Lincoln. The central extent of the site is at Ordnance Survey Grid Reference (OSGR) TF 05318 66292, as shown in Figure 1, below.
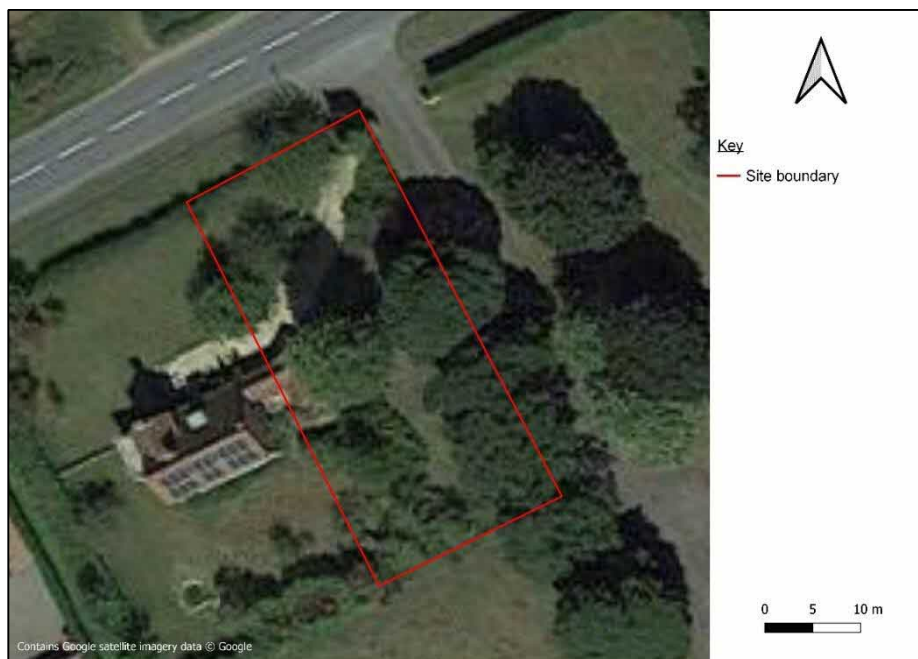
Figure 1 – Location and extent of application site

1.2　Objectives

1.2.1　The purpose of this biodiversity assessment is to determine a pre-works and post-works comparison of biodiversity units through applying the Statutory Metric Calculation Tool. This is achieved using information pertaining to the onsite habitat condition, area and species composition, which are assessed against the predicted impacts arising from the works.

1.3　Proposed development

1.3.1　The proposals involve the construction of a self-build dwelling along with associated parking and landscaping (see Appendix I).

1.3.2   The landscape proposals involve the introduction of species-rich hedgerows (comprising a minimum of six native species within a 30m length), the provision of a small area of ornamental (non-native) planting and the retention and reseeding of all remaining existing grassland with a species-rich meadow grassland mixture (comprising EM1 Meadow mixture grassland from Emorsgate, or similar). It is understood that the grassland is likely to be maintained at a low sward height, to reflect a frequent mowing regime, although the mix is expected to comprise a high diversity of grasses and forbs.

1.3.3   It is further proposed that all existing hedgerows are retained and that five new, broadleaved tree specimens are introduced onto the site.

2.0   METHODOLOGY

2.1   Field survey

2.1.1   A Phase 1 Habitat Survey was completed on 8th September 2023 by Principal Ecologist Helen Archer BSc (Hons) MCIEEM who is a full member of CIEEM and has over 14 years' experience as a full-time consultant ecologist. Helen was accompanied by Ecologist Elizabeth Fenn who has four years' experience undertaking and assisting with ecological surveys.

2.1.2   The survey was completed in accordance with the field manual for 'Phase 1 survey'[1], produced by Joint Nature Conservation Committee (JNCC), and involved identifying notable/protected habitats occurring on or adjacent to the site of works (see Appendix II). All habitats were classified using the JNCC habitat methodology, which relies on observations of the distribution, abundance, diversity and general assemblage of vegetation pertaining to terrestrial and aquatic habitats occurring within England, Wales and Scotland.

2.1.3   Photographs taken during the survey, referenced within Section 4.2 of this report, are shown under Appendix III.

2.3   Biodiversity assessment

2.3.1   The biodiversity assessment was undertaken following guidance contained within CIRIA publication *Biodiversity Net Gain – Good Practice Principals for Development*[2] and involved the following components:

A desk-based assessment using Multi Agency Geographic Information for the Countryside (MAGIC) website[3], to identify statutory protected nature conservation sites, such as Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Special Area of Conservation (SACs) occurring on or within significant proximity to the site.

The assessment also included a review of pre-existing ecological data for the works area, including the findings of a Phase 1 Habitat Survey completed on 8th September

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[1] Joint Nature Conservation Committee (2010) *Handbook for Phase 1 Habitat Survey. A Technique for Environmental Audit.*

[2] Baker, J., Hoskin, R. and Butterworth, T. (2019). *Biodiversity net gain - Good practice principles for development*. CIRIA

[3] www.magic.gov.uk accessed February 2024

2023, together with data on statutory designated nature conservation sites and priority habitats.

Measuring habitat parcels on the ground, combined with the use of online measuring tools (including Google Maps Area Calculator Tool[4]) and a review of the proposed development works referred to within the general arrangement plans.

Identifying habitat distinctiveness and undertaking a condition assessment based upon the UK Habitat Classification[5] system, *The Statutory Biodiversity Metric - Technical Annex 1: Condition Assessment Sheets and Methodology* and other appropriate condition criteria.

Application of the biodiversity mitigation hierarchy.

Identification of any irreplaceable habitats (with reference to Technical Note 4.0 of CIRIA guidelines) and/or invasive, non-native species occurring within the works footprint.

An assessment of predicted direct and indirect impacts arising from the works, including habitat clearance, disturbance and retention. This would take into account any offset activities, where applicable.

Inputting pre-development habitat data into the '*Statutory (official) Biodiversity Metric calculation tool*', issued November 2023, in addition to data pertaining to predicted post-works habitat types and condition as a result of completing the scheme. This would be used to determine a biodiversity unit scoring.

A review of changes in biodiversity units as a result of carrying out the works.

2.3.2   This Biodiversity Assessment was undertaken by Ecologist Elizabeth Fenn BSc (Hons) of Archer Ecology Ltd who is a qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has four years combined experience as a consultant ecologist. Elizabeth is proficient in undertaking habitat and botanical surveys and has completed biodiversity assessments and calculations within the housing sector.

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[4] Google (2021) *Daft Logic – Google Maps Area Calculator V6.20* [online]. Google. Available at: https://www.daftlogic.com/projects-google-maps-area-calculator-tool.htm [Accessed February 2024].

[5] UKHab Ltd (2023). *UK Habitat Classification Version 2.0* (available at https://www.ukhab.org). UKHab Ltd

3.0   RESULTS

3.1   Desk-based assessment

<u>Statutory designated sites for nature conservation</u>

3.1.1   A search using MAGIC identified that Potterhanworth Wood SSSI occurs 1.77km east of the application site. The application site also lies within Potterhanworth Wood SSSI impact risk zone. However, given that the proposals will be confined to within the footprint of the application site, no interactions are predicted between the application site and interest features forming this statutory site. Such designated sites are, therefore, not considered to be potential receptors with respect to the proposed works and do not alter the strategic significance of the site.

<u>Priority habitats</u>

3.1.2   A search using MAGIC identified that no habitats considered of principal importance to nature conservation, as per the requirements of Section 41 of the NERC Act (2006), occur on or within significant proximity to the application site. Priority Habitats are, therefore, not considered to be a potential receptor with respect to the proposed works and do not alter the strategic significance of the site.

3.2   Phase 1 Habitat survey

3.2.1   The application site is situated within a principally semi-rural setting and lies in the village of Potterhanworth in the North Kesteven district of Lincolnshire. All habitats established within the boundary of the application site are described under the following sub-headings.

<u>A3.3 – Scattered trees - Mixed</u>

3.2.2   It was apparent that a small number of scattered trees were once present on the site but have since been recently felled. These appeared to have once consisted of mature/sub-mature and young specimens of native and coniferous species (assumed to be of good condition). Subsequently, the loss of these trees has been assessed retrospectively. A single, existing tree which occurs within the northern site periphery has, however, been retained.

3.2.3   In view of the varied maturity and species of these trees, this habitat is assessed as once having potentially moderate nature conservation value on a site level.

<u>J1.2 – Amenity Grassland</u>

3.2.4   The application site is dominated by amenity grassland of a varying sward height (see Photograph 1, Appendix III). This habitat is composed of dominant red fescue *Festuca rubra* with frequent yarrow *Achillea millefolium*, perennial rye-grass *Lolium perrenne,* Yorkshire fog *Holcus lanatus*, white clover *Trifolium repens,* ragwort *Senecio jacobaea*, ribwort plantain *Plantago lanceolata* and broad-leaved dock *Rumex obtusifolius.*

3.2.5   Considering the modified nature of amenity grassland, this habitat is assessed as having low nature conservation value on a site level only.

<u>J2.1.1 – Intact hedgerow – Species-rich</u>

3.2.6   The application site supports an intact, species-rich hedgerow within the northern extent of the site. This is composed of hawthorn *Crataegus monogyna*, maple *Acer campestre,* bramble *Rubus fruticosus agg.*, blackthorn *Prunus spinosa* and elder *Sambucus nigra* with rare Pedunculate oak *Quercus robur* and dog rose *Rosa canina.*

3.2.7   Given the native composition, this habitat was appraised as having potentially moderate nature conservation value on a local level.

<u>J2.1.2 – Intact hedgerow – Species-poor</u>

3.2.8   A hawthorn hedgerow with three, mature sycamore trees *Acer pseudoplatanus* is situated on the eastern site periphery (see Photograph 2, Appendix III). This habitat was appraised as having potentially moderate nature conservation value on a site level.

3.2.9   A short hedgerow of hedgerow, occurring to the south of the site, consists of young specimens of laurel *Laurus nobilis.* This appeared to be in poor condition and was appraised as having potentially low nature conservation value on a site level only.

<u>J4 – Bare ground</u>

3.2.10   An area of hardstanding is present on the site, consisting of brick and gravel which forms a driveway (see Photograph 3, Appendix III). Areas of hardstanding do not support any significant assemblages of vegetation and were, subsequently, appraised as having negligible nature conservation value.

3.3 Baseline Survey

3.3.1   An overview of all on-site habitats and predicted impacts is given in Table 1, below, which encompasses a total, combined footprint of 0.09ha.

3.3.2   No irreplaceable habitats were recorded within the works footprint.

Table 1: Overview of Habitats and Predicted Impacts

Existing JNCC Habitat	Biodiversity Metrics calculator – Habitat equivalent (Crosher *et al.*, 2019)	Total area / length	Lost	Retained / enhanced
A3.1 – Scattered trees	Tree (urban)	0.049ha	0.0327ha	0.0163ha
J1.2 – Amenity grassland	Urban – vegetated garden	0.0765ha	0.0186ha	0.0579ha
J4 – Hardstanding	Urban – sealed surface	0.0135ha	0ha	0.0281ha
J2.1.1 – Species rich hedgerow	Species-rich native hedgerow	0.013km	0.005km	0.008km
J2.1.2 – Species poor hedgerow	Native hedgerow	0.045km	0km	0.045km
J2.1.2 – Species poor hedgerow	Non-native and ornamental hedgerow	0.009km	0.009km	0.009km

3.4 Predicted Impacts and Compensation

3.4.1   With reference to the scheme description under Section 1.3 of this report, the development activities are expected to result in the loss of areas of amenity grassland and trees to facilitate the proposed dwelling, as reflected in Table 1.

3.4.2   An overview of created habitats, which is expected to comprise a combination of artificial and semi-natural habitats over a footprint of 0.09ha, is given in Table 2, overleaf.
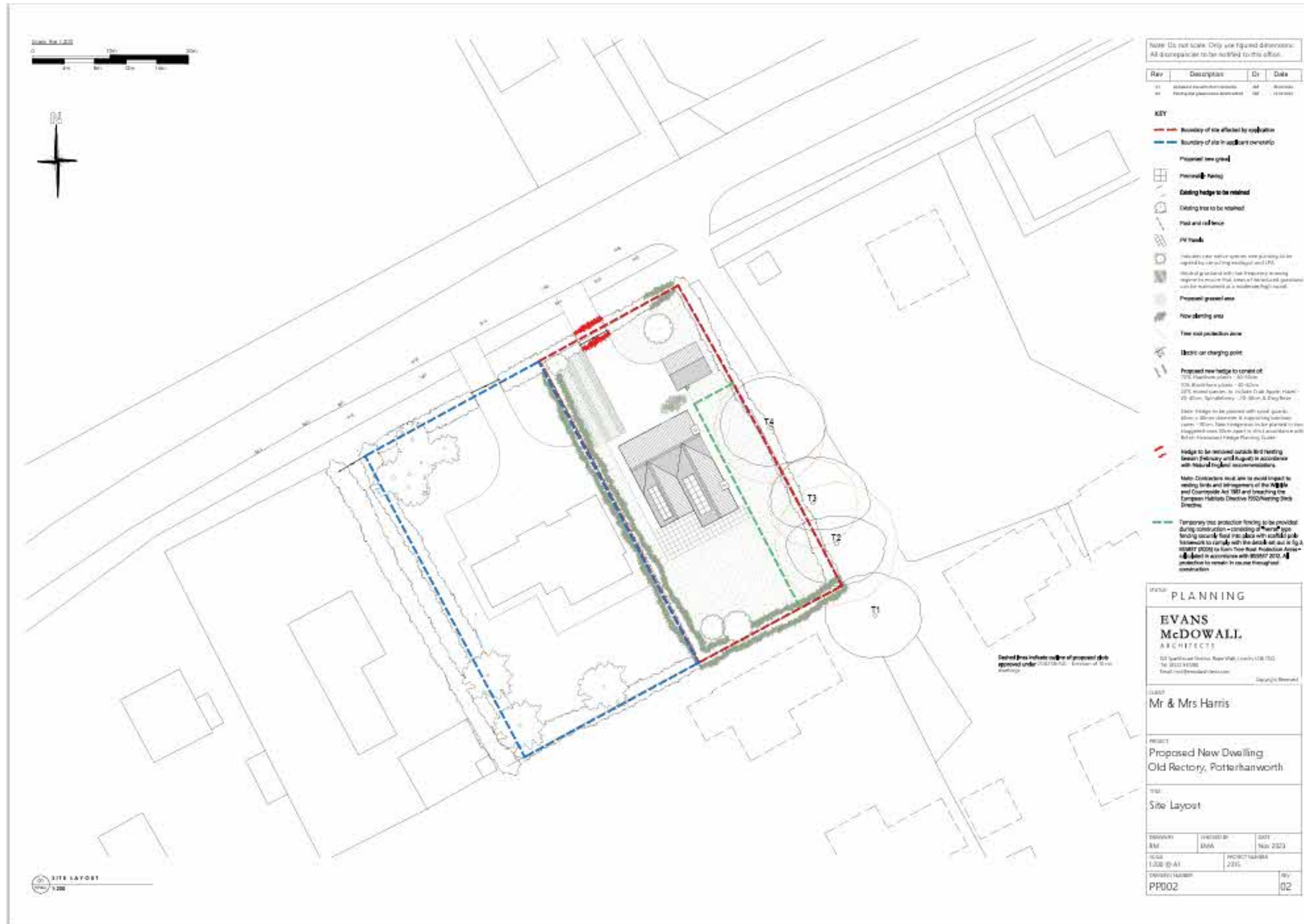
Table 2: Overview of Habitat Creation

Created/enhanced Habitat	Biodiversity Metrics calculator – Habitat equivalent (Crosher *et al.*, 2019)	Total area / length
Meadow mix grassland	Neutral grassland - Other	0.0579ha
Hardstanding and buildings	Urban – Developed land; sealed surface	0.0281ha
Permeable surface	Urban – Developed land; unsealed surface	0.0037ha
5 no. broadleaved trees	Rural tree	0.0204ha
Non-native shrubs	Urban – introduced shrub	0.0003ha
Species-rich edgerow	Species rich native hedgerow	0.063km

3.5   Pre-works and Post-works Comparison of Biodiversity Units

Results of calculator

3.5.1   The information contained within Tables 1 and 2 was inputted into the Statutory Biodiversity Metric Calculation Tool, in addition to information pertaining to the condition, distinctiveness and ecological connectivity of each habitat to the wider landscape (see Appendix IV).

3.5.2   The Statutory Biodiversity Metric Calculation Tool was used to generate a pre-works and post-works comparison of biodiversity units as a result of habitat loss/modifications incurred to enable the development. Provided that the proposed habitat creation measures are implemented, as described in report Section 1.3, the calculator has indicated a minor **GAIN** in habitat (area) biodiversity units of **+0.01 units (+1.36% change)** and a considerable **GAIN** in habitat (linear) biodiversity units amounting to **+0.42 units (+89.17% change)** post-works. This outcome assumes that areas of introduced habitats, including trees, have successfully established and that a plan of adequate, long-term management and monitoring is implemented to ensure longevity of up to 30 years. Whilst this outcome falls below the standard +10% biodiversity net gain requirements for most housing developments (as mandated within the Environment Act 2021), it is understood that self builds are presently exempt from the requirements of the Act. Subsequently, all compensatory units would be provided as a voluntary contribution to biodiversity.

Key

- Site boundary
- A3.1 - Broadleaved Parkland/scattered trees
- J1.2 - Cultivated/disturbed land - amenity grassland
- J2.1.2 - Intact hedge - species-poor
- J4 - Bare ground

Contains Google satellite imagery data © Google

0   5   10 m

APPENDIX III – PHOTOGRAPHS

Photograph 1 – Existing grassland

Photograph 2 – Hedgerow with trees

Photograph 3 – Bare ground

APPENDIX IV – BIODIVERSITY CALCULATOR INPUT

Existing Habitats

Broad Habitat	Habitat Type	Irreplaceable habitat	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic significance multiplier	Required Action to Meet Trading Rules	Total habitat units	Area retained	Area enhanced	Baseline units retained	Baseline units enhanced	Area habitat lost	Units lost
Urban	Vegetated garden	No	0.0768	Low	2	Condition Assessment N/A	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness or better habitat required ≥	0.15		0.0579	0.00	0.12	0.02	0.04
Urban	Developed land; sealed surface	No	0.0135	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Compensation Not Required	0.00			0.00	0.00	0.01	0.00
Individual trees	Rural tree	No	0.0041	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required (2)	0.03			0.00	0.00	0.00	0.03
Individual trees	Rural tree	No	0.0163	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required (2)	0.13	0.0163		0.13	0.00	0.00	0.00
Individual trees	Rural tree	No	0.0041	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required (2)	0.03			0.00	0.00	0.00	0.03
Individual trees	Rural tree	No	0.0163	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required (2)	0.13			0.00	0.00	0.02	0.13
Individual trees	Rural tree	No	0.0041	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required (2)	0.03			0.00	0.00	0.00	0.03
Individual trees	Rural tree	No	0.0041	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same broad habitat or a higher distinctiveness habitat required (2)	0.03			0.00	0.00	0.00	0.03

Existing hedgerow habitats

Hedge number	Habitat type	Length (km)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic significance multiplier	Required Action to Meet Trading Rules	Total hedgerow units	Length retained	Length enhanced	Units retained	Units enhanced	Length lost	Units lost
	Native hedgerow with trees	0.045	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	0.36	0.045	0	0.36	0.00	0.00	0.00
	Species-rich native hedgerow	0.013	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	0.10	0.013	0	0.10	0.00	0.00	0.00
	Non-native and ornamental hedgerow	0.009	V.Low	1	Poor	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	Same distinctiveness band or better	0.01	0.009		0.01	0.00	0.00	0.00

Enhanced Habitats

Baseline habitat	Total habitat area (hectares)	Baseline distinctiveness band	Baseline distinctiveness score	Baseline condition category	Baseline condition score	Baseline strategic significance category	Baseline strategic significance score	Baseline habitat units	Required Action to Meet Trading Rules	Proposed Broad Habitat	Proposed habitat	Distinctiveness change	Condition change	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic significance multiplier	Standard time to target condition (years)	Habitat enhanced in advance (years)	Delay in starting habitat enhancement (years)	Standard or adjusted time to target condition	Final time to target condition (years)	Final time to target multiplier	Standard difficulty of enhancement	Applied difficulty of enhancement	Difficulty multiplier applied	Habitat units delivered
Urban - Vegetated garden	0.0768	Low	2	Condition Assessment N/A	1	Low Strategic Significance	1	0.15	Same distinctiveness or better habitat required ≥	Grassland	Other neutral grassland	Low - Medium	Lower Distinctiveness Habitat Moderate	0.0573	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	10	0	0	Standard time to target condition applied	10	0.700	Low	Standard difficulty applied	Low	1	0.16

Proposed Habitats

New hedge number	Habitat type	Length (km)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic significance multiplier	Standard Time to target condition (years)	Habitat created in advance (years)	Delay in starting habitat creation (years)	Standard or adjusted time to target condition	Final time to target condition (years)	Final time to target multiplier	Standard difficulty of creation	Applied difficulty multiplier	Final difficulty of creation	Difficulty multiplier applied	Hedge units delivered
1	Native hedgerow	0.063	Low	2	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	5	0	0	Standard time to target condition applied	5	0.837	Low	Standard difficulty applied	Low	1	0.21

Broad Habitat	Proposed habitat	Area (hectares)	Distinctiveness	Score	Condition	Score	Strategic significance	Strategic significance	Strategic significance multiplier	Standard time to target condition (years)	Habitat created in advance (years)	Delay in starting habitat creation (years)	Standard or adjusted time to target condition	Final time to target condition (years)	Final time to target multiplier	Standard difficulty of creation	Applied difficulty multiplier	Final difficulty of creation	Difficulty multiplier applied	Habitat units delivered
Urban	Developed land; sealed surface	0.0281	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	0	0	Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Low	1	0.00
Urban	Artificial unvegetated, unsealed surface	0.0037	V.Low	0	N/A - Other	0	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	0	0	Standard time to target condition applied	0	1.000	Low	Standard difficulty applied	Low	1	0.00
Urban	Introduced shrub	0.0003	Low	2	Condition Assessment N/A	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	1	0	0	Standard time to target condition applied	1	0.965	Low	Standard difficulty applied	Low	1	0.00
Individual trees	Rural tree	0.0204	Medium	4	Moderate	2	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	27	0	0	Standard time to target condition applied	27	0.382	Low	Standard difficulty applied	Low	1	0.06