CHELDON BARTON, SOUTHEND-ON-SEA

BIODIVERSITY NET GAIN BASELINE ASSESSMENT

May 2024

Prepared by Essex Ecology Ltd.
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Title of Report	Cheldon Barton, Southend-on-Sea Biodiversity Net Gain Baseline Assessment
Client	Southend-on-Sea City Council Civic Centre Victoria Avenue Southend-on-Sea SS2 6ER
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Report Status	Final
Date of Issue	17/05/2024

This report has been compiled in accordance with BS 42021:2013 Biodiversity – Code of practice for planning and development, as has the assessment to which it relates.

The information, data, advice and opinions which have been prepared and provided are true and have been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional *bona fide* opinions.

Contents

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1. EXECUTIVE SUMMARY

1.1 This report has been prepared by Essex Ecology Ltd., for Southend-on-Sea City Council. It comprises a Biodiversity Net Gain baseline assessment of land at Cheldon Barton, West Shoebury, Southend-on-Sea, Essex.

1.2 The assessment was required in order to calculate the number of Biodiversity Units the site currently represents in order to explore opportunities for offsetting.

1.3 As the surveys were undertaken out of the optimal surveying season, a new assessment should be carried out at the optimum time of year to identify with greater accuracy the baseline biodiversity value use of the site prior to its use as a Biodiversity Net Gain offsetting site.

1.4 The site covers approximately 0.365 hectares and comprises modified grassland, with areas of ornamental shrubbery, some mature trees and numerous recently planted trees. Linear features include a native hedgerow.

1.5 The baseline units for the site's area habitats have been calculated to be **1.37,** with linear habitats amounting to **0.14** units.

1.6 Enhancement of the site's modified grassland from poor to moderate condition could generate **1 habitat unit** per **0.267 ha** (73.75% of the site) enhanced.

1.7 Creating **0.192 ha** (53.23 % of the site) of moderate condition other neutral grassland could generate a net gain of approximately **1 habitat unit**, accounting for the loss of modified grassland that would be replaced by the new habitat.

1.8 Planting **10** native trees that will reach small size, poor condition within the target time to condition will generate **0.13 habitat units**.

1.9 Creating **0.272 km** of moderate condition native hedgerow would provide **1 habitat unit,** while creating **0.136 km** of moderate species-rich native hedgerow would provide **1 habitat unit.**

2. INTRODUCTION

2.1 General Introduction

This report has been prepared by Essex Ecology Ltd., for Southend-on-Sea City Council. It comprises a Biodiversity Net Gain baseline assessment of land at Cheldon Barton, Southend-on-Sea. The assessment was required in order to calculate the number of Biodiversity Units the site currently represents in order to explore opportunities for offsetting.

2.2 Site Location and Description

The site is located off Cheldon Barton, West Shoebury, Southend-on-Sea, Essex. The Ordnance Survey grid reference for the approximate site centre is TQ 92325 86032.

The site covers approximately 0.365 hectares and comprises a grassland field, with areas of ornamental shrubbery, some mature trees and numerous recently planted trees. Along the south-western boundary is a short length of native hedgerow.

The surrounding landscape is entirely urban residential housing. Approximately 400 metres to the north is arable farmland. Southend-on-Sea city centre lies approximately four kilometres west of the site.

See Map 1 for a plan of the site and Appendix 1 for site photographs.

2.3 Objective

The aim of the assessment was to assess the site's biodiversity baseline using the latest Statutory Metric (DEFRA, 2023) for potential future use as a site for habitat creation in relation to offsetting the ecological impacts of development projects elsewhere. Recommendations for habitat creation, enhancement and management are also included in this report.

2.4 Assessment Methodology

Habitats on the site were mapped in line with the UK Habitat Classification, using the methodology detailed in the UK Habitat Classification User Manual, Version 2.0 (UK Habitat Classification Working Group, July 2023) using data collected by Essex Ecology during site visits conducted on 27th October 2023 during suitable weather conditions.

Each habitat (referred to under this system as a Primary Habitat) was classified using an alphanumeric code, with reference to the UK Habitat Classification Version 2.0 (UKHab Ltd. 2023). This method is designed to enable the description of each habitat on a hierarchical basis up to a maximum of five levels, including the identification of Habitats of Principal Importance in England (HPIE) (formerly known as Biodiversity Action Plan (BAP) habitats) and those listed on Annex I of the Conservation of Habitats and Species Regulations 2017 (as amended).

The site was mapped using QGIS. Habitat data was then converted into Biodiversity Units, so that the Statutory Metric could be applied.

Attributes that include extent, condition, distinctiveness and Biodiversity Units have been provided.

Habitat condition has been assessed according to the technical guidance provided with the Statutory Metric as well as the surveying ecologist's professional judgement.

Habitats are automatically assigned distinctiveness bands within the Statutory Metric. The distinctiveness bands and criterion thresholds are as follows:

Distinctiveness Band	Criterion Threshold
Very High Distinctiveness	Small amount of remaining habitat with a lot of it unprotected by designation. Endangered or Critical European red list habitats.
High Distinctiveness	Remaining Priority Habitats not in very high distinctiveness band and other red list habitats.
Medium Distinctiveness	Non-Priority Habitats with significant wildlife benefit and one replaceable Priority Habitat (arable field margins).

Low Distinctiveness	Agricultural and urban land use of lower biodiversity value.
Very Low Distinctiveness	Urban, with artificial structure, which are un-vegetated, unsealed surface or built linear features of very low biodiversity value.

2.5 Mapping

The site habitat maps were produced using QGIS computer software. The Minimum Mapping Unit (MMU) was employed for this survey where possible. Minimum mapped habitat areas were 25m^2 and minimum mapped linear features were five metres in length. Habitats mapped as areas were digitised using polygons and linear habitats were mapped as lines.

2.6 Competence

Charlotte Smith has been with the company since September 2020 after previously working with Essex Ecology as an intern. She has completed a BSc in Zoology and is a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (CIEEM). She has undertaken numerous ecological site appraisals, habitat assessments and a wide range of protected species surveys, including Great Crested Newt, reptile, bat and Water Vole. She has caried out multiple Biodiversity Net Gain assessments using Natural England Metrics 2.0, 3.0 and 4.0. She has attended a course specific to the Metric and UK Habitat Classification.

2.7 Constraints and limitations

The habitats present on any site are subject to change over time. All assessments of this kind are based upon the situation as it was at the time the fieldwork upon which the assessment was based was carried out.

The habitat assessment was undertaken during the winter, at a time when many plant species cannot be identified. Therefore, the degree to which certain habitat types could be identified or differentiated from others and the accuracy of habitat condition assessments was limited.

Therefore, a new assessment should be carried out at the optimum time of year to identify with greater accuracy the baseline biodiversity value use of the site prior to its use as a Biodiversity Net Gain offsetting site.

3. ASSESSMENT RESULTS

3.1 Summary

The following UK Habitat Classification habitats are currently present at the site:

Baseline Area Habitats	Area (hectares)
Grassland – Modified grassland	0.3607
Urban – Introduced scrub	0.0047
Individual trees	0.0489
Total Habitat Area*:	**0.4143**

*Total Habitat Area is greater than the size of the site as a proxy for canopy biomass. It is based on the root protection formula derived from The British Standard "Trees in Relation to Design, Demolition and Construction - Recommendations" (BS 5837) (2012).

Baseline Linear Habitats	Length (kilometres)
Native hedgerow	0.021
Total Length:	**0.021**

See Map 1 for primary habitats and Map 2 for habitat parcel reference locations.

3.2 Strategic Significance

The site is a Protected Green Space under Southend-on-Sea's Local Plan, and is designated for its recreational and amenity value, in addition to its value to biodiversity. Therefore, all habitats are assigned a medium strategic significance.

The site does not lie within any statutory or non-statutory sites.

3.3 Baseline Area Habitat Conditions

3.3.1 Grassland - Modified grassland

The site is predominantly made up of modified grassland, G1. It has poor species diversity, being dominated by Perennial Rye-grass, with some Cock's-foot and Meadow Barley. Herbaceous plants include White Clover, Yarrow, Ribwort Plantain, Common Mallow, Common Daisy and Dandelion.

Condition Criteria – Low Distinctiveness Grassland		
		G1
A	There are 6-8 vascular plant species per m2 present, including at least 2 forbs. **Note - this criterion is essential for achieving Moderate or Good condition.**	Fail – Less than 6 species per m2
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for vertebrates and invertebrates to live and breed.	Fail – all sward is less than 7cm
C	Any scrub present accounts for less than 20% of the total grassland area. (Some scattered scrub such as bramble *Rubus fruticosus* agg. may be present).	Pass
D	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	Pass
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens).	Pass
F	Cover of bracken *Pteridium aquilinum* is less than 20%.	Pass
G	There is an absence of invasive non-native plant species (as listed on Schedule 9 of WCA).	Pass
	Total	**5**
	Condition	**Poor**

The grassland was automatically given ‘poor’ condition as passing condition A is required for ‘moderate and ‘good’ condition.

3.3.2 Urban – Introduced shrub

There are small areas of ornamental shrub to the north of the site including various Cotoneaster species, Viburnum, alongside some Gorse and Bramble and a young Ash. It is worth noting that many Cotoneaster species are schedule 9 invasive species within the UK, and while those found onsite were not identified to species, there is a high chance that they may be invasive.

A condition assessment for built linear features is not applicable within the metric.

3.3.3 Individual trees – rural trees

The broad habitat type ‘Individual trees’ may be used where a tree (or a group of trees) over 7.5 cm in stem diameter at breast height (DBH) does not meet or contribute towards the definition of another broad habitat type.

Three trees over 7.5 cm in were recorded onsite stem diameter at breast height (DBH), while a further twelve recently planted trees were not included in the assessment as they were under 7.5 cm.

T1 is a medium sized mature Apple tree to the west of the site, and T2 is a medium sized mature Cherry to the north of the site. These trees were recorded as good condition. T3, a medium sized non-native Hazel, was recorded as 'moderate' condition due to lacking ecological niches and being non-native but having a large canopy with little or no adverse impact on tree health by human activities.

Condition Criteria : Individual Trees - rural			
	T1	**T2**	**T3**
A: The tree is a native species (or at least 70% within the block are native species).	Pass	Pass	Fail
B: The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	Pass	Pass	Pass
C: The tree is mature (or more than 50% within the block are mature).	Pass	Pass	Pass
D: There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	Pass	Pass	Pass
E: Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.	Fail	Fail	Fail
F: More than 20% of the tree canopy area is oversailing vegetation beneath.	Pass	Pass	Pass
Total	5	5	4
Condition	**Good**	**Good**	**Moderate**

3.4 Baseline Linear Habitat Conditions

3.4.1 Hedgerows

A native hedgerow runs along the south-western boundary of the site, H1. It is comprised of mainly Hawthorn and Field Maple. Some bramble is present within the hedge alongside Firethorn, a non-native plant. The understorey comprises of predominantly Ivy.

The hedgerow was assessed as being good condition due to being of good height, species assemblage and with lack of gaps.

Habitat Type: Linear Features: Hedgerows		**H1**
A1: Height	>1.5 m average along length	Pass
A2: Width	>1.5 m average along length	Pass
B1: Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length	Pass
B2: Gap - hedge canopy continuity	Gaps make up <10% of total length; and No canopy gaps >5 m	Pass
C1: Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: · Measured from outer edge of hedgerow; and · Is present on one side of the hedgerow (at least).	Pass
C2: Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground.	Fail – Ivy ground layer
D1: Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA3) and recently introduced species.	Pass
D2: Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities.	Pass
	Total:	**7**
	Condition:	**Good**

4. BASELINE BIODIVERSITY UNIT CALCULATIONS

4.1 Baseline Biodiversity Units

The baseline Biodiversity Unit (BU) site values are presented in the following tables. Habitats that are of the same type and condition have been grouped together.

Area Habitat Type	Distinctiveness Score		Condition Score		Baseline Biodiversity Units (BU)
Grassland – Modified grassland	Low	2	Poor	1	0.79
Urban – Introduced scrub	Low	2	Condition Assessment N/A	1	0.01
Individual trees – rural trees	Medium	4	Good	2	0.43
Individual trees – rural trees	Medium	4	Moderate	3	0.14
				Total:	**1.37***

*Note the sum of columns may differ from the total units stated. This is due to rounding and is not considered significant. The totals stated reflect those calculated within the Biodiversity Metric Calculator Tool.

Linear Habitat Type	Distinctiveness Score		Condition Score		Baseline Biodiversity Units (BU)
Native hedgerow	Low	2	Good	3	0.14
				Total:	**0.14**

All calculations were put through the Biodiversity Net Gain Metric 'Off-site habitats' tabs.

The baseline Biodiversity Units for the site's area habitats have been calculated to be **1.37**. The baseline units for the site's linear habitats have been calculated to be **0.14** units.

5. POTENTIAL HABITAT UNIT UPLIFT

5.1 Overview

Habitat units can be gained by enhancing the current habitats to higher condition or habitat type or creating new habitats. The following habitat creation and enhancement measures are suggested. Recommendations are based on the site's current habitats and their condition, the relative feasibility of potential enhancement measures and the need to take other site use, including public use, into account.

5.1.1 Temporal Risk Multiplier

The temporal risk is the 'time to target condition' for any habitat and determines how long a particular habitat type is likely to take to reach the desired condition score.

For this site, the time difference between loss of habitat on-site and the compensation (enhancement/creation) of habitat off-site has been assumed as **0 years** for both creation in advance and delay in starting habitat creation or enhancement. If habitat compensation is started in advance to habitat loss, this will need to be adjusted.

5.2 Habitat Enhancement

As the majority of the site is currently poor condition modified grassland, improving this to a higher condition is considered to be the easiest way to gain habitat units from the site. This would involve enhancing the current poor condition modified grassland to moderate condition.

Below is a table showing the grassland enhancement option. The area given is that required to achieve **1 habitat unit**.

Current habitat		**Size of area to be enhanced (ha)**		**Proposed habitat**		**% of habitat used**
Habitat	**Condition**		→	**Habitat**	**Condition**	
Modified grassland	Poor	0.267	→	Modified grassland	Moderate	**73.75**

5.3 Habitat Creation

5.3.1 Grassland

Another way to gain habitat units would be to create a habitat of higher distinctiveness, and therefore value. Creating moderate condition neutral grassland would be the easiest way to achieve habitat units. Creation of other habitats could be possible, but, considering the small size of the site, other neutral grassland would be less likely to cause opposition from members of the public as it will still allow the site to be used as an area of grassland.

Creation of moderate condition neutral grassland would entail the loss of an area of modified grassland, but, as the new grassland is of higher distinctiveness and condition, its creation would achieve a higher number of habitat units once it has reached target condition, so creating a net gain.

The area given in the table below is that required to achieve **1 net habitat unit** (accounting for the loss of units from the modified grassland to be lost to make way for other neutral grassland creation) at this site with the creation of higher distinctiveness, moderate condition grassland.

Habitat	Distinctiveness	Condition	Size of habitat creation area (ha)	% of site used
Other neutral grassland	Medium	Moderate	0.192	53.23

5.3.2 Tree planting

If considered appropriate for the site, tree planting can be used to attain further habitat units. The table below shows the number of native trees that could be planted to achieve **0.13 habitat units**. This is with the assumption that new whips would be planted instead of more mature trees.

Tree Planting						
Habitat	**Tree size within 30 years**	**Native/non-native**	**Condition**	**No. of trees**	**Metric area equivalent (ha)**	**Habitat units achieved**

Individual tree – rural	Small (greater than 7cm and less than or equal to 30cm Diameter at breast height)	Native	Poor	10	0.0407	**0.13**

5.4 Linear Habitat Creation

As the current hedgerow is already of good condition, there is no option to achieve additional habitat units by enhancement. It should be maintained at good condition. Therefore, the creation of new linear features is the sole option for achieving additional linear habitat units.

There is the potential, subject to feasibility, that the site could be used to plant more hedgerows. Due to the small size of the site, the boundaries would be the best position and would provide corridors for wildlife to follow, as well as providing shelter and food for wildlife. Currently the site boundaries are fenced and back on to the surrounding residential gardens.

- Planting 0.272 km of moderate condition native hedgerow would provide **1 habitat unit.**
- Planting 0.136 km of moderate species-rich native hedgerow would provide **1 habitat unit.**

To be considered species rich, a hedgerow has to be planted with five or more native species.

5.5 Management

5.5.1 Overview

In order to achieve the habitat enhancements and creations within the 30-year timeframe, the habitats will have to be managed to achieve the condition targets. Management advice is listed below for each suggested scenario (see section 5.2 – 5.4).

5.5.2 Grassland enhancement

To achieve the target enhancement of the current poor condition modified grassland to moderate condition, certain criteria in the condition assessments will have to be achieved by changing the management and mowing regime.

Currently the grassland fails criteria A and B, with a pass of A required for moderate to good condition modified grassland.

- Criteria A: "There are 6-8 vascular plant species per m2 present, including at least 2 forbs."
- Criteria B: "Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for vertebrates and invertebrates to live and breed."

To achieve moderate condition, an increase in species per m2 is required. Examples of ways to increase the biodiversity of plants in a grassland include:

- Less frequent cutting
- Cutting in early spring to knock back dominant grasses, and an autumn cut
- Reducing nutrients by removing grass cuttings
- Consider native seeding to add species
- Varying the sward height

5.5.3 Grassland creation

Other neutral grassland is defined as a grassland where ‘Perennial Rye-grass *Lolium perenne* is likely to be present at <30% with between 9 and 15 further species (m2) also present.’

To create other neutral grassland, it is crucial that nutrients are removed from the soil to encourage the growth of a greater variety of plant species. The same recommendations mentioned above in 5.5.2 are recommended here, with the addition of greater measures to reduce the nutrient levels, such as:

- Removing the nutrient rich topsoil layer by turf stripping or, for a gentler approach, scarification.
- Planting yellow rattle to control dominant grasses.

To reach the target condition of moderate, it is essential that the grassland passes Criteria A of the medium-high distinctiveness grassland condition assessment:

"The grassland is a good representation of the habitat type it has been identified as, based on its UKHab description - the appearance and composition of the vegetation closely matches the characteristics of the specific grassland habitat type. Indicator species listed by UKHab for the specific grassland habitat type are consistently present. "

Other management needed to maintain condition includes:

- Preventing scrub encroachment
- Preventing bare ground from exceeding 5 % cover
- Preventing species indicative of sub-optimal condition from exceeding 5% cover, such as Creeping Thistle, White Clover and Greater Plantain

Map 1. Cheldon Barton, Southend-on-Sea
Baseline Habitats

Red Line Boundary

Area Habitats Baseline
u1 - Introduced shrub
Modified grassland

Hedgerow Baseline
Native hedgerow

Individual Tree Baseline
Existing Medium Rural Tree

Habitat Reference
G - Grassland
T1-3 - Tree target note

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Map 2. Cheldon Barton, Southend-on-Sea Baseline Habitat Conditions

Red Line Boundary

Baseline Habitat Condition
Poor
Condition Assessment N/A

Baseline Hedgerow Condition
Good

Baseline Individual tree Condition
Moderate
Good

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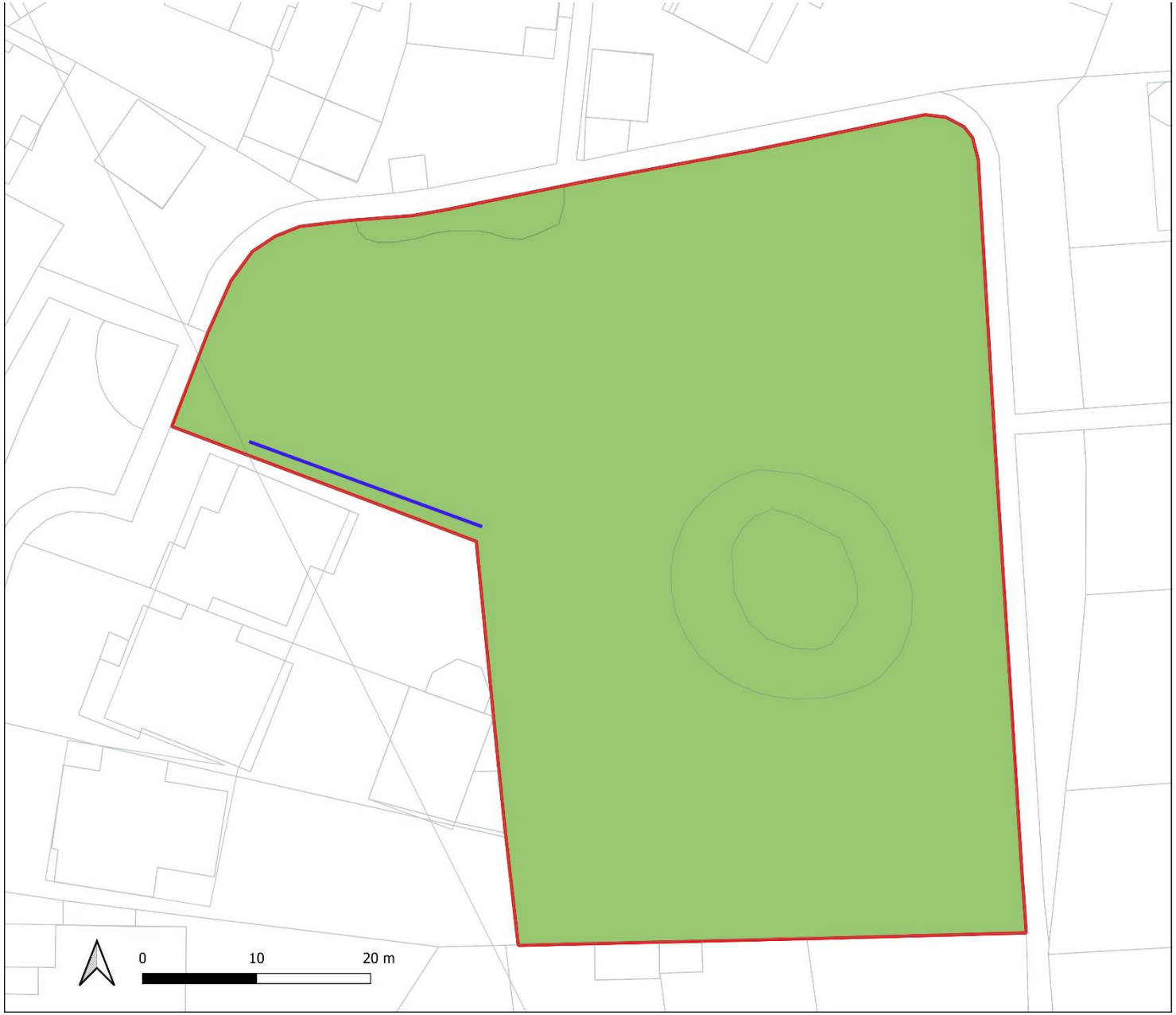

Map 3. Cheldon Barton, Southend-on-Sea
Habitat Distinctiveness

Red Line Boundary

Baseline Habitat Distinctiveness
Low

Baseline Hedgerow Distinctiveness
Low

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Bibliography and References

The Statutory Biodiversity Metric (DEFRA) November 2023

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Appendix 1: Photographs

Photograph 1. View of the site's grassland.

Photograph 2. Introduced shrub borders at the north of the site.

Photograph 3. Grassland with newly planted trees and Photograph 4. Native hedgerow.

Photograph 5-7. Trees T1-T3.