EAST BEACH, SOUTHEND-ON-SEA

BIODIVERSITY NET GAIN BASELINE ASSESSMENT

May 2024

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Title of Report	East Beach, Southend-on-Sea Biodiversity Net Gain Baseline Assessment
Client	Southend-on-Sea City Council Civic Centre Victoria Avenue Southend-on-Sea SS2 6ER
Client representative	Claire Victory, Principal Planner, Southend-on-Sea City Council
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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.

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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 11.3 hectares (ha) and comprises areas of amenity grassland, some woodland, patches of scrub and urban land.

1.5 The baseline units for the site's area habitats have been calculated to be **22.03**, with linear habitats amounting to **1.07** units.

1.6 Enhancement of the site's modified grassland from poor to moderate condition could generate **1 habitat unit** per **0.0268 ha** enhanced (3.247% of the sites modified grassland).

1.7 Enhancement of the site's neutral grassland from poor to moderate condition could generate **1 habitat unit** per **0.134 ha** enhanced (43.2% of the sites neutral grassland).

1.8 Enhancement of the site's other broadleaved woodland from poor to moderate condition could generate **1 habitat unit** per **0.0134 ha** enhanced (25.3% of the sites broadleaved woodland).

1.9 Alternatively, enhancing the site's other broadleaved woodland from poor to good condition could generate **1 habitat unit** per **0.115 ha** enhanced (21.71% of the sites broadleaved woodland).

1.10 Enhancing the entire length (**0.103km**) of the line of trees from poor to moderate condition would gain **0.34 habitat units**.

1.11 Habitat creation can also be used to gain habitat units. Creating **0.194 ha** of moderate condition other neutral grassland could generate **1 net habitat unit.**

1.12 Creating **0.194 ha** of moderate condition mixed scrub would also generate **1 net habitat unit.**

1.13 Planting **80** native trees that will reach small size, poor condition within the target time to condition will generate **1 habitat units.**

1.14 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 East Beach, 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

East Beach is located at George Street, Shoeburyness, Essex. The Ordnance Survey grid reference for the approximate site centre is TQ 94384 85151.

The site covers approximately 11.3 hectares (ha) and comprises areas of amenity grassland, some woodland, patches of scrub and urban land.

To the north and west of the site is urban residential housing, and to the east is the river Thames. Foulness SSSI lies immediately adjacent to the eastern boundary 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 25th October and 27th October and 14th December 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.

Target notes have been used to describe certain areas of habitat, the locations of which are indicated on the habitat maps by use of target note codes (G for grassland, S for scrub and W for woodland etc.).

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	8.2028
Grassland – Other neutral grassland	0.3099
Scrub – Blackthorn scrub	0.031
Scrub – Bramble scrub	0.1549
Urban – Developed land; sealed surface	0.7342
Urban - Artificial unvegetated, unsealed surface	0.3149
Urban – Built linear features	1.0276
Urban – Introduced shrub	0.074
Woodland and forest – Other woodland; broadleaved	0.5296
Individual trees	1.1238
Total Habitat Area*:	12.5027

*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	0.128
Line of trees	0.103
Total Length:	**0.131**

See Map 1 for baseline habitats and Maps 2 for habitat parcel reference locations and Maps 3 & 4 for tree reference locations.

3.2 Strategic significance

The whole of the site is a Protected Green Space under the Southend-on-Sea 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. Urban habitats are assigned low strategic significance.

3.3 Baseline Area Habitat Conditions

3.3.1 Modified grassland

Vegetation dominated by a few fast-growing grasses on fertile, neutral soils. It is frequently characterised by an abundance of Rye-grass and White Clover.

The majority of the site is amenity grassland (G1). This species-poor grassland is dominated by Perennial Rye-grass, with few herbs including Common Daisy and Greater Plantain. There is an area that has been left longer between the boat yard area and the fenced off pond.

The grassland G3 is made up of Perennial Rye grass, Wall Barley, Ribwort Plantain, common Mallow and Bristly Oxtongue. There are areas of ornamental planting, including Pampas grass and a corner of *Carpobrotus edulis*, an invasive plant species.

Condition Criteria – Low Distinctiveness Grassland						
A	**B**	**C**	**D**	**E**	**F**	**G**
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.**	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.	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).	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.	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens).	Cover of bracken *Pteridium aquilinum* is less than 20%.	There is an absence of invasive non-native plant species (as listed on Schedule 9 of WCA).

	Condition Assessment: Low Distinctiveness Grassland								
	A	**B**	**C**	**D**	**E**	**F**	**G**	**Total Passes**	**Condition**
G1	Fail – less than 6-8 vascular plant species*	Fail – all short	Pass	Pass	Pass	Pass	Pass	5	**Poor**
G3	Fail – less than 6-8 vascular plant species*	Fail – all short, recently cut	Pass	Pass	Pass	Pass	Fail - *Carpobrotus edulis* present	4	**Poor**

*passing this criterion is essential for achieving Moderate or Good condition.

3.3.2 Other neutral grassland

Grasslands on neutral soils, with Perennial Rye-grass likely to be present at <30% with between nine and fifteen further species (m2) also present.

The grasslands G2 run along the eastern boundary of the site, between the amenity grassland and the adjacent SSSI, Foulness. The northern end of this grassland is made up of Common Mallow, Hogweed, Alexanders, White Clover, Hemlock, Ribwort Plantain and Yorkshire Fog. There are areas of Bramble encroachment.

As the grassland gets closer to the beach, some sea species such as Sea Couch, and Sea Beet add to the composition. Other species present include Black Horehound, Yarrow, Cock's-foot and Black Mustard.

Condition Criteria – Medium Distinctiveness Grassland					
A	**B**	**C**	**D**	**E**	**F**
The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description). **Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.**	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 insects, birds and small mammals to live and breed.	Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens.	Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.	Combined cover of species indicative of sub-optimal condition and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. If any invasive non-native plant species3 (as listed on Schedule 9 of WCA4) are present, this criterion is automatically failed.	There are 10 or more vascular plant species per m2 present, including forbs that are characteristic of the habitat type. **Note - this criterion is essential for achieving Good condition for non-acid grassland types only.**

	Condition Assessment – Medium Distinctiveness Grassland							
	A	**B**	**C**	**D**	**E**	**F**	**Total Passes**	**Condition**
G2	Fail – Few indicator species present	Pass	Pass	Fail- scrub encroachment	Pass	Fail – less than 10 or more vascular plant species per m2 present	4	**Poor**
G4	Fail – Few indicator species present	Pass	Pass	Fail –scrub encroachment	Pass	Fail – less than 10 or more vascular plant species per m2 present	3	**Poor**

3.3.3 Heathland and shrub – Blackthorn scrub

Dense scrub with dominant Blackthorn.

Dense Blackthorn scrub (S1) was recorded as an island within the amenity grassland, with some Common Nettle at the edges.

This area of scrub has been assigned the condition 'poor'.

Condition Criteria – Scrub				
A	**B**	**C**	**D**	**E**
The parcel represents a good example of its habitat type - the appearance and composition of the vegetation closely matches its UKHab description (where in its natural range). - At least 80% of scrub is native, - There are at least three native woody species, - No single species comprises more than 75% of the cover (except hazel *Corylus avellana*, common juniper *Juniperus communis*, sea buckthorn *Hippophae rhamnoides* or box *Buxus sempervirens*, which can be up to 100% cover).	Seedlings, saplings, young shrubs and mature (or ancient or veteran) shrubs are all present.	There is an absence of invasive non-native plant species (as listed on Schedule 9 of WCA) and species indicative of sub-optimal condition make up less than 5% of ground cover.	The scrub has a well-developed edge with scattered scrub and tall grassland and or forbs present between the scrub and adjacent habitat.	There are clearings, glades or rides present within the scrub, providing sheltered edges.

	Condition Assessment – Blackthorn scrub						
	A	**B**	**C**	**D**	**E**	**Total Passes**	**Condition**
S1	Fail – Single species comprises more than 75% of the cover	Fail – Seedlings not present	Pass	Fail – short grassland up to base	Fail – No clearings, glades or rides present within the scrub	1	**Poor**

3.3.4 Heathland and shrub - Bramble scrub

Dense scrub with dominant Bramble.

Dense Bramble scrub was recorded in multiple locations. The scrub patch S2 lies within the area of woodland, W1 and along the back of the grassland G4.

An area of Bramble scrub, S3, is concentrated on the western corner of the site near the High street entrance to the park.

The scrub patch S4 is an area of predominantly bramble scrub behind a building to the south of the site. The scrub is made up of dense Bramble with some taller shrubs, with an alexanders and Ivy understorey.

Bramble scrub is automatically given a low condition score, ‘poor’, due to the dominance of that single species.

3.3.5 Urban - Artificial unvegetated, unsealed surface

Land that has no or very low (10%) cover of vegetation through direct or indirect human activity, and the soil surface is not sealed with impervious materials.

The gravel boat yard parking area to the north o the site was given this classification.

Condition assessments are not applicable to this urban feature.

3.3.6 Urban – Built linear features

Surfaced paths.

There are multiple hard standing paths intersecting the site.

Condition assessments are not applicable to this urban feature.

3.3.7 Urban – Introduced shrub

Non-native tall phanerophytes, mid phanerophytes or low phanerophytes planted in a garden or park setting.

There are two areas of introduced shrub at the site, the first being around the new car park to the south of the site, and the other at the very southern end of the site with an area of hardstanding. Both have non native shrub species and ornamental planting.

Condition assessments are not applicable to this urban feature.

3.3.8 Woodland and forest – Other woodland; broadleaved

Vegetation dominated by trees that are more than 5 metres high when mature, which form distinct, although sometimes open canopy with a canopy cover greater than 25%.

The woodland areas W1 is located as a band along the north-western boundary of the site, split in the centre by the grassland G4. The woodland is made up of Elm, Sycamore, Field Maple, some Ash, with a ground layer of Ivy, Alexanders, Hogweed, Common Mallow and Ground Ivy. The scrub layer includes the species Hawthorn, young Sycamore and Elder. Bramble scrub is dominant throughout. The woodland becomes sparser at its south-western corner.

The woodland W2 is a small area at the back of some residential housing to the south of the site, bordering the fence line. It is made up of mainly Elder and some elm. There is a dense Ivy and Common Nettle ground layer, with some Bramble scrub.

Condition Criteria – Other woodland; broadleaved						
	Features					
A	**Age Distribution of trees**					
	3 pts	3 age classes	**2 pts**	2 ages classes	**1 pt**	1 age class
B	**Wild, domestic and feral herbivore damage**					
	3 pts	none	**2 pts**	<40% of woodland	**1 pt**	>40% of woodland
C	**Invasive plant species**					
	3 pts	none	**2 pts**	<10% cover AND no Rhododendron or Cherry laurel	**1 pt**	>10% cover OR Rhododendron or Cherry Laurel
D	**Number of native tree species**					
	3 pts	five or more	**2 pts**	3-4 species	**1 pt**	0-2 species
	Cover of native tree and shrub species					

E	**3 pts**	>80% of canopy and understorey	**2 pts**	50-80% of canopy and understorey	**1 pt**	<50% of canopy and understorey
F	**Open space within woodland**					
	3 pts	10-20% temporary open space	**2 pts**	20-40% temporary open space	**1 pt**	>40% temporary open space
G	**Woodland regeneration**					
	3 pts	all three classes	**2 pts**	one or two classes	**1 pt**	no classes or coppice regrowth in woodland
H	**Tree health**					
	3 pts	<10% mortality and no pests/diseases/dieback	**2 pts**	10-25% mortality and/or dieback, low risk pests/disease present;	**1 pt**	>25% mortality or high risk pests/disease present
I	**Vegetation and ground flora**					
	3 pts	ancient woodland indicators	**2 pts**	recognisable NVC community	**1 pt**	no recognisable NVC community
J	**Woodland vertical structure**					
	3 pts	3+ storeys	**2 pts**	2 storeys	**1 pt**	0-1 storeys
K	**Veteran trees**					
	3 pts	2+/ha	**2 pts**	1/ha	**1 pt**	none
L	**Amount of deadwood**					
	3 pts	50%	**2 pts**	25-50%	**1 pt**	<25%
M	**Woodland disturbance**					
	3 pts	no enrichment/damage	**2 pts**	<1 ha enriched OR <20% area damaged ground	**1 pt**	>1 ha enriched OR >20% are damaged ground

Habitat type:	**Condition Assessment - Other woodland; broadleaved**														
Scores of '1' '2' or '3' are allocated against each criteria assessed.															
	Criterion													**TOTAL**	**Condition**
Parcel Ref	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**		
W1	2	3	3	1	2	3	2	2	1	1	1	1	2	24	Poor
W2	2	3	3	2	2	3	1	2	1	1	1	1	2	23	Poor

3.3.9 Individual trees

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

92 trees were recorded individually across the whole site, focused mainly along the central path that runs through the middle of the site and along the boundaries of the site. A range of species were recorded, including Aspen, Ash and Field Maple.

41 trees were recorded as good condition and 51 as moderate condition.

Condition Criteria – Individual trees
A: The tree is a native species (or at least 70% within the block are native species).
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).
C: The tree is mature (or more than 50% within the block are mature).
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.
E: Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.
F: More than 20% of the tree canopy area is oversailing vegetation beneath.

Habitat type:	**Condition Assessment - Individual Trees**							
	Criterion (P -Pass, F-Fail)						**TOTAL**	**Condition**
Parcel Ref	**A**	**B**	**C**	**D**	**E**	**F**		
T1	F	P	F	P	F	P	3	Moderate
T2	P	P	F	F	P	P	4	Moderate
T3	P	P	F	P	F	P	4	Moderate
T4	P	P	F	P	F	P	4	Moderate
T5	P	P	F	P	F	P	4	Moderate
T6	F	P	F	P	P	P	4	Moderate
T7	F	P	F	P	F	P	3	Moderate
T8	P	P	F	P	F	P	4	Moderate
T9	P	P	F	P	F	P	4	Moderate
T10	P	P	F	F	F	P	3	Moderate
T11	F	P	F	P	F	P	3	Moderate
T12	P	P	F	P	F	F	3	Moderate
T13	F	P	F	P	F	P	3	Moderate
T14	F	P	F	P	F	P	3	Moderate
T15	F	P	F	P	F	P	3	Moderate
T16	F	P	F	P	F	P	3	Moderate
T17	F	P	P	P	F	P	4	Moderate
T18	F	P	P	P	F	P	4	Moderate
T19	P	P	F	P	P	P	5	Good
T20	P	P	F	P	F	P	4	Moderate

T21	P	P	P	P	F	P	5	Good
T22	F	P	P	P	F	P	4	Moderate
T23	F	P	P	P	F	P	4	Moderate
T24	F	P	P	P	F	P	4	Moderate
T25	F	P	P	P	F	P	4	Moderate
T26	P	P	P	P	P	P	6	Good
T27	F	P	F	P	F	P	3	Moderate
T28	F	P	F	P	F	P	3	Moderate
T29	F	P	F	P	F	P	3	Moderate
T30	P	P	P	P	P	P	6	Good
T31	P	P	P	P	p	P	6	Good
T32	P	P	P	P	F	P	5	Good
T33	P	P	P	P	F	P	5	Good
T34	P	P	P	P	F	P	5	Good
T35	P	P	P	P	F	P	5	Good
T36	P	P	P	P	P	P	6	Good
T37	P	P	P	P	P	P	6	Good
T38	P	P	P	P	F	P	5	Good
T39	P	P	F	P	F	P	4	Moderate
T40	F	P	P	P	F	P	4	Moderate
T41	P	P	P	F	P	P	5	Good
T42	P	P	P	F	P	P	5	Good
T43	P	P	P	P	F	P	5	Good
T44	P	P	P	P	F	P	5	Good
T45	P	P	P	P	F	P	5	Good
T46	F	P	P	P	P	P	5	Good
T47	P	P	F	P	F	P	4	Moderate
T48	P	P	F	P	F	P	4	Moderate
T49	P	P	F	P	F	P	4	Moderate
T50	P	P	P	P	F	P	5	Good
T51	P	P	F	P	F	P	4	Moderate
T52	P	P	P	P	F	P	5	Good
T53	P	P	P	P	F	P	5	Good
T54	P	P	P	P	F	P	5	Good
T55	P	P	F	P	F	P	4	Moderate
T56	P	P	F	P	F	P	4	Moderate
T57	P	P	F	P	F	P	5	Moderate
T58	P	P	P	P	F	P	6	Good
T59	P	P	P	P	F	P	5	Good
T60	P	P	P	P	P	P	6	Good
T61	P	P	P	P	P	P	6	Good
T62	P	P	P	P	F	P	5	Good
T63	P	P	P	P	P	P	6	Good

T64	P	P	P	P	F	P	5	Good
T65	P	P	P	P	P	P	6	Good
T66	F	P	F	P	F	P	3	Moderate
T67	F	P	P	P	F	P	4	Moderate
T68	P	P	P	P	P	P	6	Good
T69	P	P	P	P	P	P	6	Good
T70	P	P	P	P	P	P	6	Good
T71	P	P	P	P	P	P	6	Good
T72	P	P	P	P	P	P	6	Good
T73	P	P	P	P	P	P	6	Good
T74	F	P	P	P	F	P	4	Moderate
T75	F	P	P	P	F	P	4	Moderate
T76	F	P	P	P	F	P	4	Moderate
T77	F	P	P	P	F	P	4	Moderate
T78	P	P	P	P	P	P	6	Good
T79	P	P	P	P	F	P	5	Good
T80	P	P	P	P	F	P	5	Good
T81	P	P	P	P	P	P	6	Good
T82	P	P	P	P	F	P	5	Good
T83	F	P	F	P	F	P	3	Moderate
T84	F	P	F	P	F	P	3	Moderate
T85	F	P	F	P	F	P	3	Moderate
T86	P	P	F	P	P	P	5	Good
T87	F	P	F	P	P	P	4	Moderate
T88	F	P	P	P	F	P	4	Moderate
T89	F	P	F	P	F	P	3	Moderate
T90	F	P	F	P	F	P	3	Moderate
T91	F	P	F	P	F	P	3	Moderate
T92	F	P	P	P	F	P	4	Moderate

3.4 Baseline Linear Habitat Conditions

3.4.1 Hedgerows

A native hedgerow, H1, runs along the northern boundary of the site. It comprises of predominantly Hawthorn, with some Holly and Elm throughout. The understorey comprises of Ivy.

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).	Fail
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:	**6**
	Condition:	**Good**

3.4.2 Line of trees

A line of trees runs along the western edge of the new car park at the south of the site, amongst a band of introduced shrub. The trees are made up of Ash and Acer sp., with some with ivy growing up the main trunk.

Habitat Type: Linear Features: Line of Trees		**LT1**
A	At least 70% of trees are native species.	Fail
B	Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide.	Fail – some larger gaps
C	One or more trees has veteran features and or natural ecological niches for vertebrates and invertebrates, such as presence of standing and attached deadwood, cavities, ivy or loose bark.	Pass - Ivy
D	There is an undisturbed naturally-vegetated strip of at least 6 m on both sides to protect the line of trees from farming and other human activities (excluding grazing). Where veteran trees are present, root protection areas should follow standing advice.	Fail – surrounded by non native shrubbery
E	At least 95% of the trees are in a healthy condition (deadwood or veteran features valuable for wildlife are excluded from this). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	Pass
	Total:	**2**
	Condition:	**Poor**

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	18.05
Grassland – Other neutral grassland	Medium	4	Poor	1	1.36
Heathland and shrub – Blackthorn scrub	Medium	4	Poor	1	0.14
Heathland and shrub – Bramble scrub	Medium	4	Condition Assessment N/A	1	0.68
Urban – Developed land; sealed surface	Very low	0	Condition Assessment N/A	0	0
Urban – Artificial unvegetated, unsealed surface	Very Low	0	Condition Assessment N/A	0	0
Urban – Built linear features	Very low	0	Condition Assessment N/A	0	0
Urban – Introduced shrub	Low	2	Condition Assessment N/A	1	0.15
Other woodland; broadleaved	Medium	4	Poor	1	0.5296
Individual trees – rural trees	Medium	4	Good	3	0.6474
Individual trees – rural trees	Medium	4	Moderate	2	0.4601
Individual trees – urban trees	Medium	4	Moderate	2	0.0163
Total:					**22.03***

*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	0.84

Line of trees	Low	2	Poor	1	0.23
				Total:	**1.07**

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

The total baseline biodiversity units present at the site is **23.1**.

5. POTENTIAL HABITAT UNIT UPLIFT

5.1 Overview

Habitat units can be gained by enhancing the current habitats to higher condition or higher value 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.

If habitats are to be enhanced/created in advance, then the temporal risk will need to be changed accordingly which will impact the level of biodiversity units provided.

5.2 Habitat Enhancement

The best way to gain habitat units would be to enhance the current habitats to higher condition. 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.

The woodland areas are currently in poor condition. Enhancing them to moderate condition would also gain habitat units.

The thin bands of neutral grassland along the eastern and northern edge of the site are currently also in poor condition, and could be enhanced to moderate condition to gain further habitat units.

Below is a table showing various enhancement options. The areas given are what is 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	**0.268**	→	Modified grassland	Moderate	**3.247**
Other neutral grassland	Poor	**0.134**	→	Other neutral grassland	Moderate	**43.2**
Other broadleaved woodland	Poor	**0.134**	→	Other broadleaved woodland	Moderate	**25.30**
Other broadleaved woodland	Poor	**0.115**	→	Other broadleaved woodland	Good	**21.71**

5.2.1 Linear habitats

As the current hedgerow H1 is already of good condition, there is no option to achieve additional habitat units by enhancement, instead it should be maintained at good condition.

The line of trees, LT1, is currently poor condition and enhancement to moderate condition is considered possible. Enhancing the whole length to moderate condition would gain **0.34 habitat units.**

5.3 Habitat Creation

5.3.1 Grassland and scrub

Another way to gain habitat units would be to create a habitat of higher distinctiveness, and therefore value. Creating moderate condition neutral grassland and/or mixed scrub would be the easiest way to achieve habitat units. Either would add greater habitat diversity to the site, but consideration will need to be given to public opinion as scrub while extremely valuable for wildlife, is often not favoured by the public.

Creation of moderate condition neutral grassland and/or mixed scrub would entail the loss of an area of modified grassland, but, as the new habitats are 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 the habitat creation) at this site with the creation of higher distinctiveness, moderate condition grassland and/or mixed scrub.

Habitat	Distinctiveness	Condition	Size of habitat creation area (ha)	% of site used
Other neutral grassland	Medium	Moderate	0.194	16.03
Mixed scrub	Medium	Moderate	0.194	16.03

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 **1 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	80	0.3257	**1**

5.4 Linear Habitat Creation

There is the potential, subject to feasibility, that the site could be used to plant more hedgerows. Planting hedgerows along the boundaries of the site, such as the south-western corner or along the hard standing paths that cross the grassland would provide habitat corridors for wildlife.

- 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 Modified 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 Neutral grassland enhancement

Currently both areas of neutral grassland fails criteria A and F, with a pass of A required for moderate to good condition other neutral grassland, and a pass of F for good condition.

- Criteria A: "The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description)."
- Criteria F: "There are 10 or more vascular plant species per m2 present, including forbs that are characteristic of the habitat type."

To achieve moderate condition, an increase in species per m2 is required. The management suggestions given in section 5.5.2 above would also achieve this for other neutral grassland.

5.5.4 Line of trees enhancement

The line of trees currently fails most of the condition criteria, including having more than 70% native species, continuous tree canopy and having naturally vegetated habitat on both sides of the trees. To reach moderate condition, improving one of these features would be necessary. The best way to achieve this would be by planting more native trees in the larger gaps between trees – doing this will likely increase the native trees to over 70% while also reducing the gaps, leading to a pass of both features.

5.5.5 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

5.5.6 Scrub creation

There are multiple ways to create areas of scrub within the grassland. Scrub will grow in unmanaged areas close to areas of trees and shrubs, where there is an existing seed source. This can be alongside hedgerows or alongside a wood edge, to create a transition between wood and open ground.

The simplest way would be to allow for natural regeneration, but some planting may be needed and will help increase the diversity of species. The scrub should be planted in clumps instead of lines to recreate a more natural establishment, with unplanted gaps left to create open ground as part of the mosaic. Cuttings or the use of Layering from nearby mature scrub could be used.

Species to use should include:

- Hawthorn
- Blackthorn
- Hazel
- Dog Rose
- Field Rose

Further management should include rotational cutting – the best scrub is when there is a mosaic of different heights and ages, and therefore it should not all be cut at once when established.

Map 1. East Beach, Southend-on-Sea, Baseline Habitats

Red Line Boundary

Habitats Baseline
- Artificial unvegetated, unsealed surface
- Blackthorn scrub
- Bramble scrub
- Built linear features
- Developed land; sealed surface
- Introduced shrub
- Modified grassland
- Other neutral grassland
- Other woodland; broadleaved

Hedgerow Baseline
- Line of trees
- Native hedgerow

Individual tree Baseline
- Existing Large Rural Tree
- Existing Medium Urban Tree
- Existing Medium Rural Tree
- Existing Small Rural Tree

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Map 2. East Beach,
Southend-on-Sea,
Habitat Reference Locations

Red Line Boundary

Area Habitats
- Artificial unvegetated, unsealed surface
- Blackthorn scrub
- Bramble scrub
- Built linear features
- Developed land; sealed surface
- Introduced shrub
- Modified grassland
- Other neutral grassland
- Other woodland; broadleaved

Linear Habitats
- Line of trees
- Native hedgerow

Habitat Reference
G - Grassland
S - Scrub
W - Woodland

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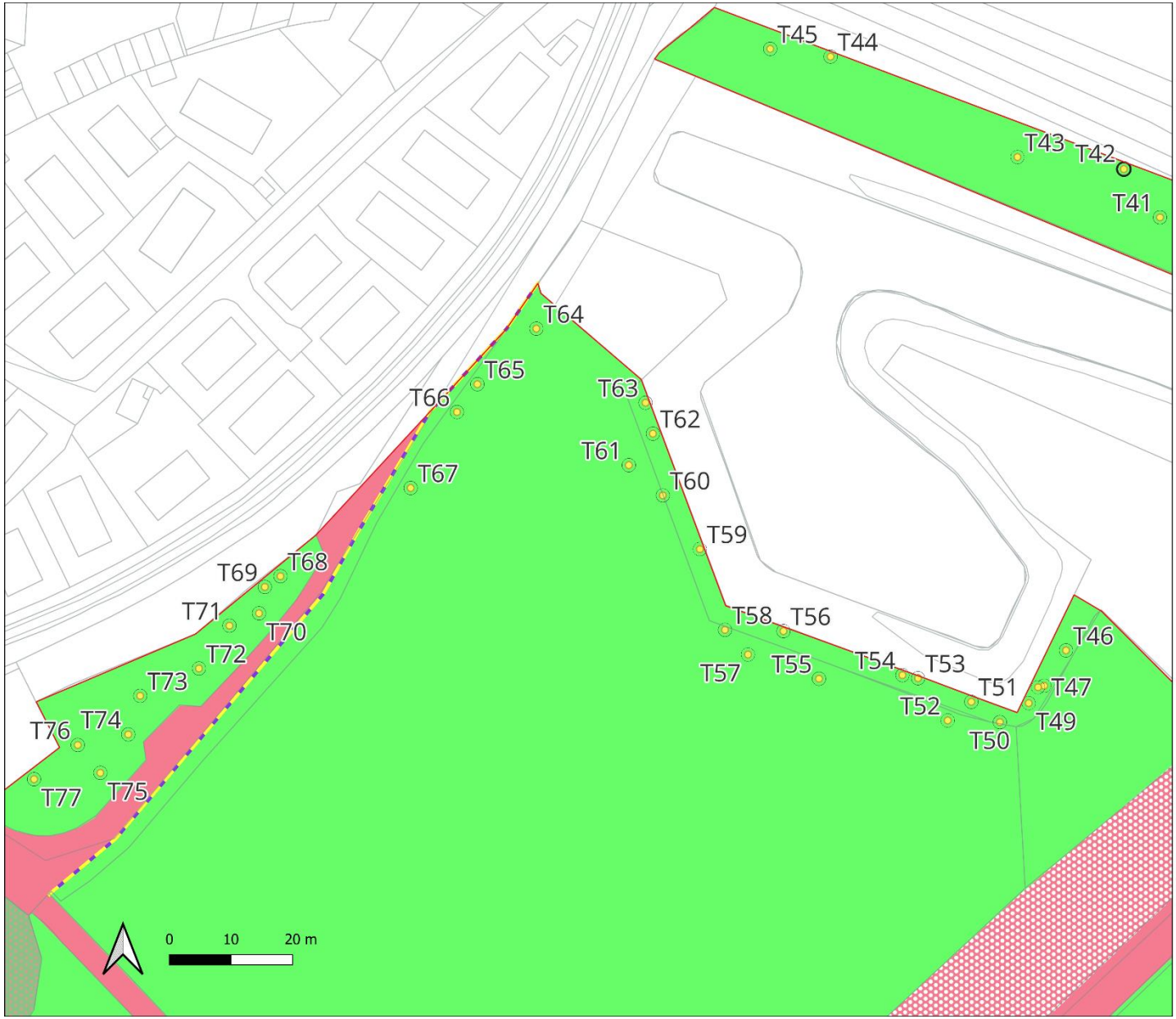

Map 3. East Beach,
Southend-on-Sea,
Tree Reference Locations

Red Line Boundary

T41 - T77 Tree Target Notes

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Map 4. East Beach, Southend-on-Sea, Tree Reference Locations

Red Line Boundary

T1 - T40, T79 - T92 - Tree Target Notes

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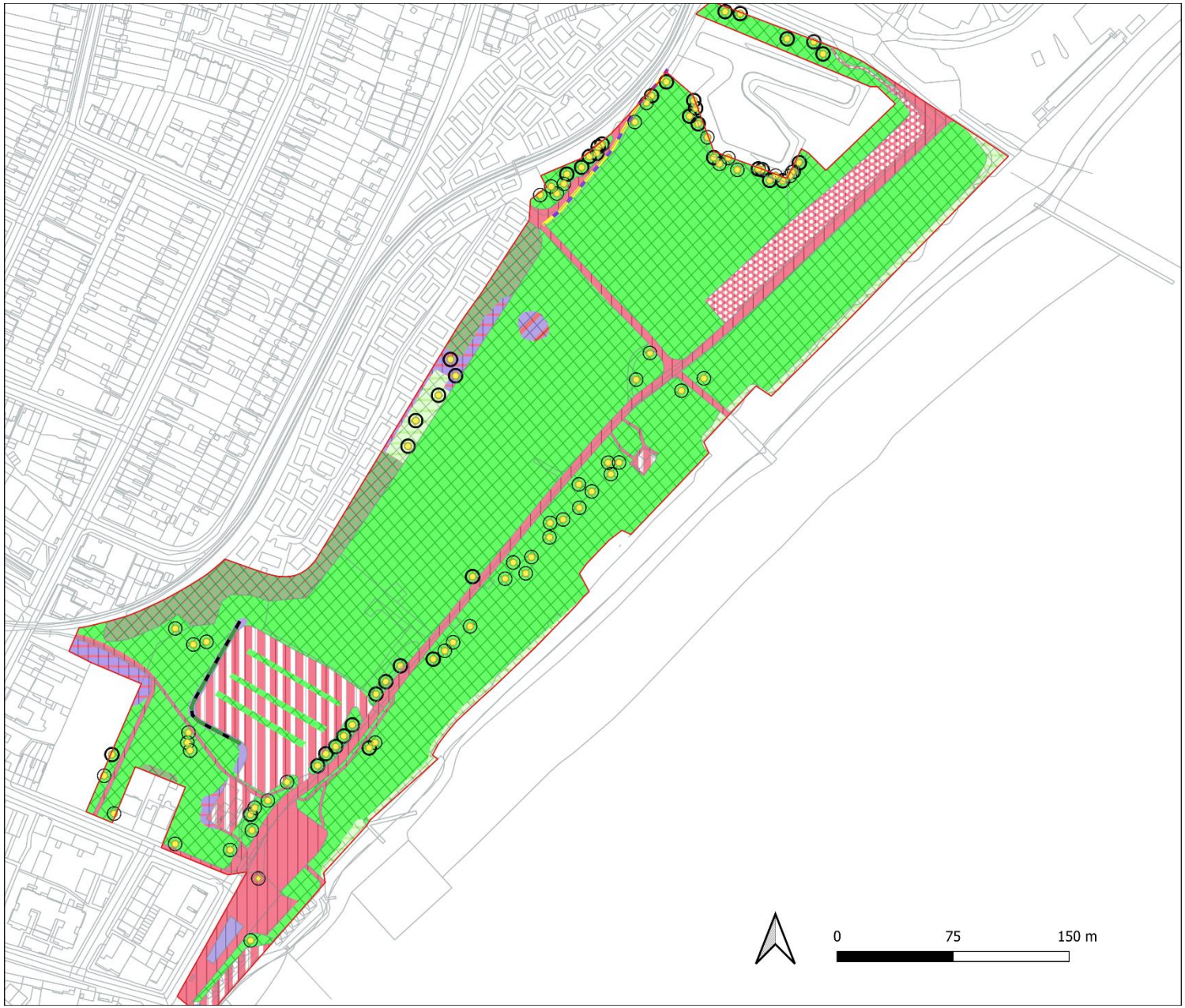

Map 5. East Beach, Southend-on-Sea, Habitat Conditions

Red Line Boundary

Baseline Habitat Condition
- Poor
- N/A - Other
- Condition Assessment N/A

Baseline Hedgerow Condition
- Good
- Poor

Baseline Individual tree Condition
- Moderate
- Good

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Map 6. East Beach, Southend-on-Sea, Habitat Distinctiveness

Red Line Boundary

Baseline Habitat Distinctiveness
Medium
Low
V.Low

Baseline Hedgerow Distinctiveness
Low

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Bibliography and References

The Statutory Biodiversity Metric (DEFRA) November 2023

UKHab Ltd (July 2023). UK Habitat Classification 2.0 (at https://www.ukhab.org)

Appendix 1: Photographs

Photograph 1. The north-eastern corner of the grassland G2.

Photograph 2. The grassland G1 and associated hard standing and buildings.

Photograph 3. Grassland G3.

Photograph 4. Grassland G2.

Photograph 5. Hedgerow H1.

Photograph 6. Scrub patch S1.

Photograph 7. Scrub patch S2.

Photograph 8. Woodland W1.

Photograph 9. Scrub patch S3.

Photograph 10. Line of trees LT1 and introduced shrubs around car park.

Photograph 11. Group of Ash trees to the south of car park.

Photograph 12. Group of trees and amenity grassland by H1.