Surrey Wildlife Trust
Ecology Services

Technical Report

Adur Local Plan Biodiversity Study

Adur Council

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Wildlife Trust Consultancies

Constructionline Gold Member

ISO 14001 ENVIRONMENTAL MANAGEMENT

ISO 45001 HEALTH & SAFETY MANAGEMENT

ISO 9001 QUALITY MANAGEMENT

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Project number			

Report and version number	Summary of changes
1.0	N/A

Commission date	30/01/2025

Validity of report (CIEEM, 2019)	In most cases, this report will be valid for 12 months. Where habitat management has not been altered and new features have not formed, it is possible the report remains valid for between 12 and 18 months, however it is advised an updated site visit is undertaken to confirm this. Where more than 18 months have elapsed an ecologist should review the information to confirm whether the information in this report can be relied upon. Reports more than three years old are unlikely to remain valid.

The contents of this report were correct at the time of the site visit. The report is provided for the sole use of the named client and is confidential.

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Acronyms

Acronym	Definition
ACIEEM	Associate Member of CIEEM
AWI	ancient woodland indicator
BAP	Biodiversity Action Plan
BCT	The Bat Conservation Trust
BNG	Biodiversity Net Gain
BOA	Biodiversity Opportunity Areas
BOCC	Birds of Conservation Concern
BSBI	Botanical Society of Britain and Ireland
BSI	British Standard Institute
CEH	Centre for Ecology & Hydrology
CFGM	Coastal Floodplain and Grazing Marsh
CFMP	Catchment Flood management plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
DAFOR	Dominant, Abundant, Frequent, Occasional, and Rare
DEFRA	Department for Environment, Food and Rural Affairs
EEC	Ecology, Environment and Conservation
GBI	Green and Blue Infrastructure
GCI	Global Climate Initiatives
GDP	Gross Domestic Product
GIS	Geographic Information Systems
HGBI	Herpetofauna Groups of Britain & Ireland
HPI	Habitats of Principal Importance
IEMA	Institute of Environmental Management and Assessment
ILP	The Institution of Lighting Professionals
JNCC	Joint Nature Conservation Committee
LCP	Least-Cost Paths
LGS	Local Geological Sites
LISI	London Invasive Species Initiative
LNP	Local Nature Partnerships
LNR	Local Nature Reserve
LNS	Local Nature Sites
LPA	Local Planning Authority
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographic Information for the Countryside
MCIEEM	Full member of CIEEM
NERC	Natural Environment and Rural Communities
NHS	National Health Service
NPPF	The National Planning Policy Framework

NRV	Notable Road Verge
OART	Ouse and Adur Rivers Trust
OECD	The Organisation for Economic Co-operation and Development
ONS	The Office for National Statistics
OSMM	Ordnance Survey MasterMap
PSGA	Public Sector Geospatial Agreement
PTES	Peoples Trust for Endangered Species
RSV	Road Side Verge
SNP	Surrey Nature Partnership
SPD	Supplementary Planning Document
SPI	Species of Principal Importance
SQE	Suitably Qualified Ecologist
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Drainage Systems
SWT	Surrey Wildlife Trust
VAT	Value Added Tax
WCA	The Wildlife and Countryside Act

1 Non-technical summary

1.1.1 Adur Council is preparing a new local plan (15-year period from 2026-2041). SWT Ecology Services have provided information including: ecologically sensitive areas and valuable connectivity corridors; suitability of potential sites to become LWS; suitability of potential site allocations; justification for delivering a higher than mandated BNG and policy wording, to inform this emerging plan.

Adur District Summary

1.1.2 The most ecologically valuable habitats within the district include those associated with the Adur Estuary and River Adur. The southern boundary, adjacent to the coast, and northern boundary adjacent to the South Downs National Park, are key ecologically valuable sites. The three BOAs present in the study area have also been identified to be of high importance, supporting habitats of high ecological value and key corridors for connectivity.

Review of Potential Local Wildlife Sites

1.1.3 The three potential LWS' all demonstrate that they may, or are likely, meet the Sussex Local Wildlife Site Selection criteria; key supporting features include providing connectivity within the landscape and value for appreciate of nature and learning.

Assessment of Potential Site Allocations

1.1.4 The three potential site allocations with the highest ecological constraints include Site C: Lancing Meadows, Site E: Shoreham Gateway and Site G: Land East of Manor Close. These three sites support a large cover of habitats with high ecological value and also demonstrate to be valuable for connectivity in the study area.

1.1.5 Site B: Land East of Adur Close, Site D: Land North of Hill Farm Way, Site F: Land at Upton Farm, have the lowest ecological constraints.

1.1.6 Site A: Car Park, Beach Green, Site D: Land North of Hill Farm Way, Site E: Shoreham Gateway are located within or adjacent to BOA; habitat creation in these areas should be focussed on the BOA objectives.

1.1.7 Opportunities for enhancement exist for all the potential site allocations.

Connectivity analysis

1.1.8 Any nature restoration across Adur is recommended to be prioritised within the connectivity corridor. Creating stepping stones between these through enhancing open spaces and playing field boundaries will further enhance opportunities for biodiversity across Adur. It has been identified in this evidence study that connectivity could also be improved through appropriate allocation of potential LWS and potential site allocations.

Policy Recommendations and BNG Delivery

1.1.9 Focus on improving the connectivity network; maximise tree protection/creation and incorporate measures to enhance biodiversity and socio-economic benefits in tandem.

1.1.10 Given the severity of the climate change and biodiversity crisis, limited financial impact of delivering 20% versus 10% biodiversity net gain, it is highly advised the Council requests developments deliver a 20% biodiversity net gain and offsite offsets are prioritised within the connectivity corridor.

Key

Adur LPA Boundary

Botolphs
Tinpots Cottage
Anchor Bottom
Bushy Bottom
Tenant Hill
Lychpole Bottom
Annington Hill Barn
Passies Pond
Cliff House
Mill Hill
Benfield Valley
Cockroost Hill
Coombehead Wood
Coombes
Thundersbarrow Hill
Mount Zion
6 Erringham Farm
Mossy Bottom
Whitelot Bottom
Mile Oak Farm
Coombes Copse
Mossy Bottom Barn
The Den
Little Den
Old Erringham Farm
Southwick Hill
New Barn
Lychpole Farm
Foredown Hill
A27
Valley Barn
Beggars Bush
Steep Down
Lychpole Hill
Applesham Farm
Steyning Road
Mile Oak
Chalky Road
A293
Streamside
Waterworks Cottage
Buckingham Barn
New Kingston Barn
Fox Way
Creek Cottage
Lancing Hill
Steep Down House
Coombe Barn
Portslade Village
Lambleys Barn
Titch Hill
Locks Hill
Upper Shoreham Road
Sompting Abbotts
North Lancing
Old Shoreham Road
Mill Lane
Buckingham Road
Eastern Avenue
B2167
Manor Hall Road
Southern Cross
Upper Brighton Road
Southwick
West Street
Sompting
Shoreham-by-Sea
Crabtree Lane
River Adur
The Canal
A259
Kingston Lane
B2194
North Road
A2025
Lower Cokeham
Sompting Road
Latham Lodge
Shoreham Beach
East Arm
Widewater
B2223
South Lancing
Chesswood Road
Lancing Beach
East Worthing
Lyndhurst Road

N

Scale: 1:30,000

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Created By: JW
Map Revision Number: 1.1
6292, 14/03/2025

Figure 1: Adur Local Plan Study Area

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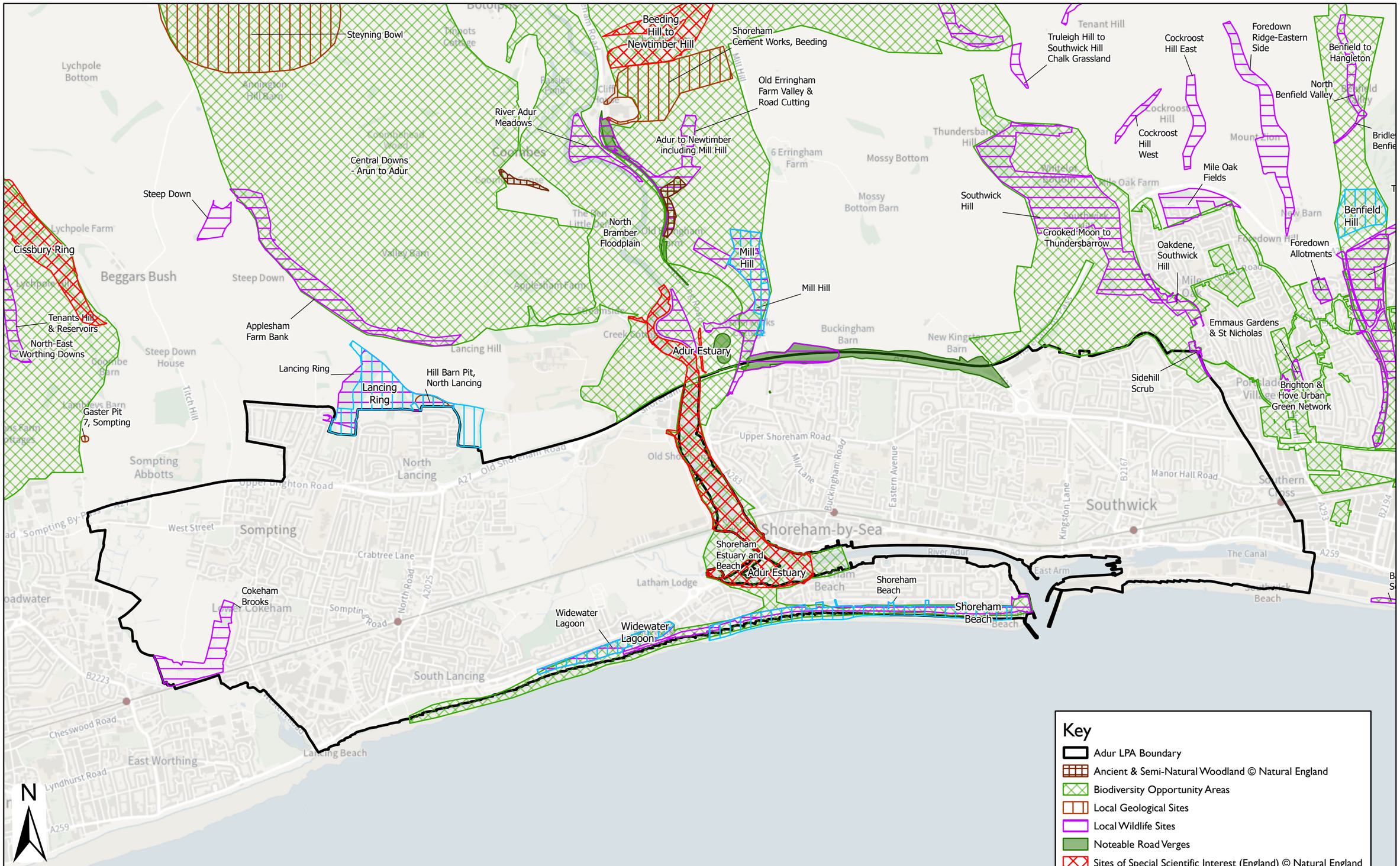

Key

- Adur LPA Boundary
- Ancient & Semi-Natural Woodland © Natural England
- Biodiversity Opportunity Areas
- Local Geological Sites
- Local Wildlife Sites
- Noteable Road Verges
- Sites of Special Scientific Interest (England) © Natural England
- Local Nature Reserves (England) © Natural England

Scale: 1:30,000

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6292, 17/03/2025

Figure 2: Adur Local Plan Statutory & Non-Statutory Designated Sites for Nature Conservation

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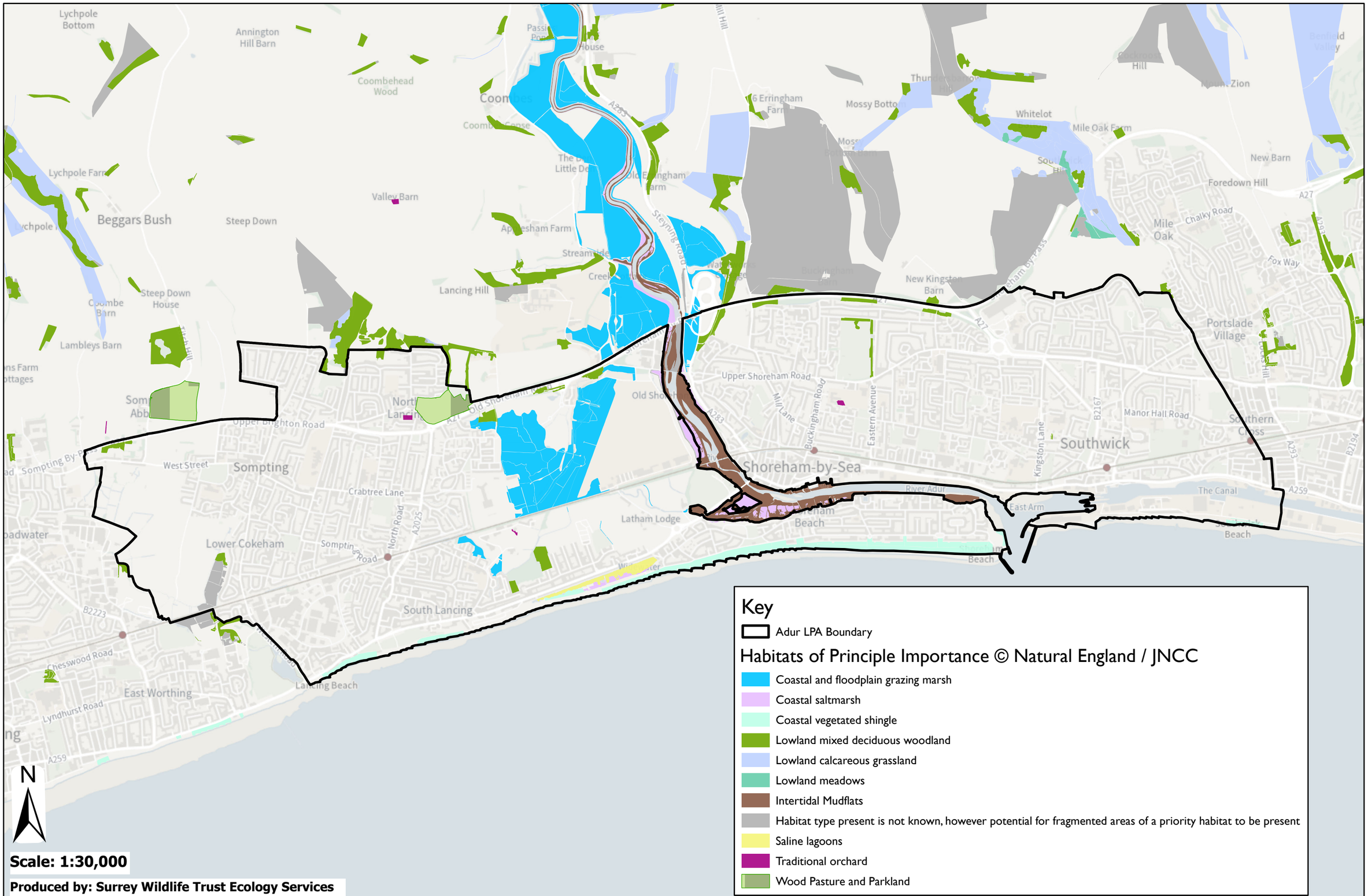
Ecology Services



Key

- Adur LPA Boundary

Habitats of Principle Importance © Natural England / JNCC

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal vegetated shingle
- Lowland mixed deciduous woodland
- Lowland calcareous grassland
- Lowland meadows
- Intertidal Mudflats
- Habitat type present is not known, however potential for fragmented areas of a priority habitat to be present
- Saline lagoons
- Traditional orchard
- Wood Pasture and Parkland

N

Scale: 1:30,000

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Map Revision Number: 3.3
6292, 17/03/2025

Figure 3: Adur Local Plan Habitats of Principle Importance

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Key

Potential Local Wildlife Sites

Adur LPA Boundary

Sompting Brooks

Silver Sands

North Canal Bank

N

Scale: 1:27,000

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Created By: JW
Map Revision Number: 4.4
6292, 19/03/2025

Figure 4:
Potential Local Wildlife Sites

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Ecology Services

Key

Potential Site Allocations

Adur LPA Boundary

Land at Upton Farmhouse

Land east of Manor Close

Land at Mill Hill, Shoreham-by-Sea

Shoreham Gateway

Land north of Hill Farm Way

Lancing Meadows

Land east of Adur Close

Car park, Beach Green

Scale: 1:27,000

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Created By: JW
Map Revision Number: 5.1
6292, 19/03/2025

Figure 5:
Potential Site Allocations

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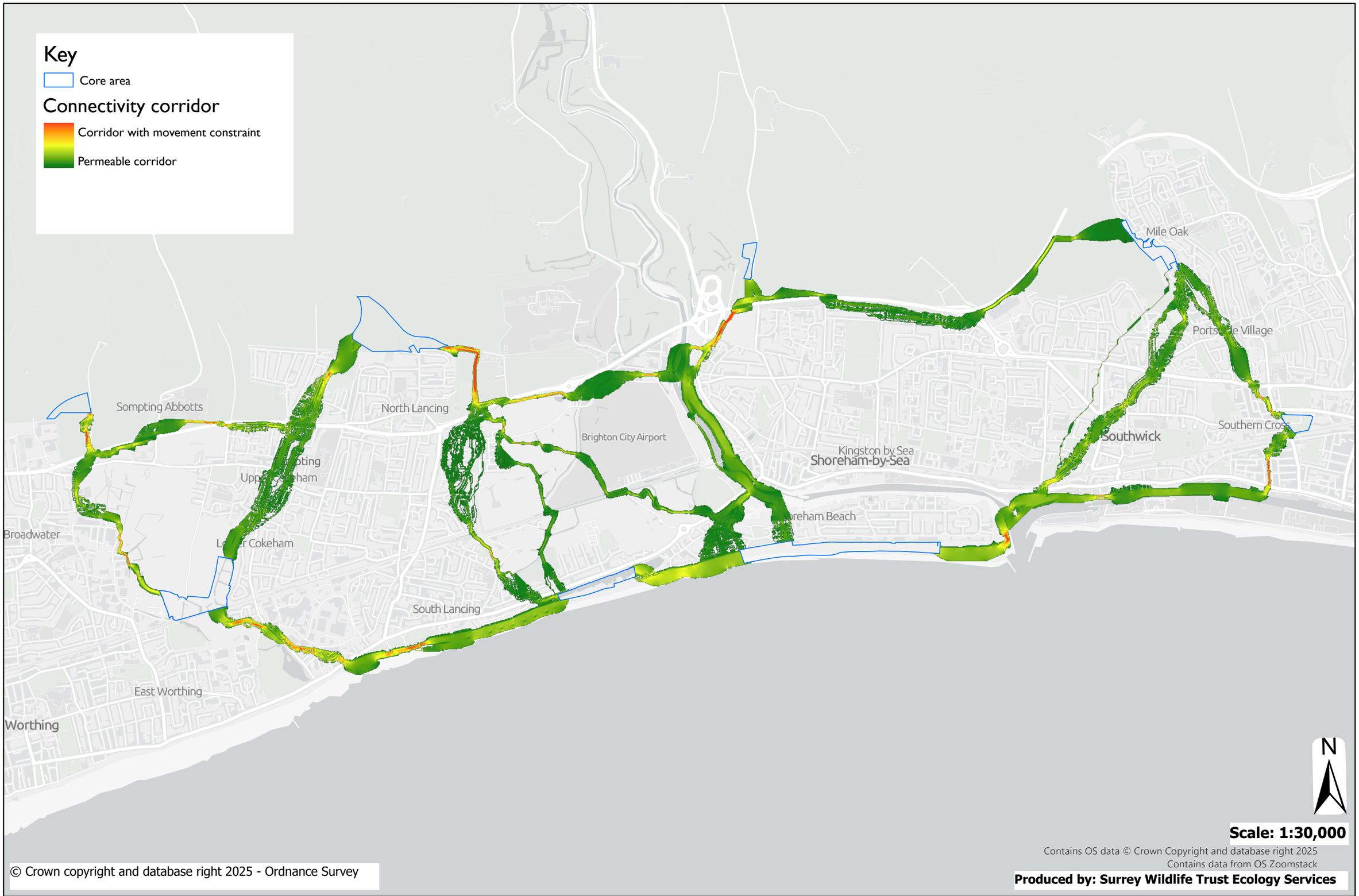
Ecology Services



Created By: MG
Map Revision Number: 01

Figure 6:
Connectivity Corridor

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Map Revision Number: 03

Figure 7:
Potential LWS and Site Allocations in the Context of the Connectivity Corridor

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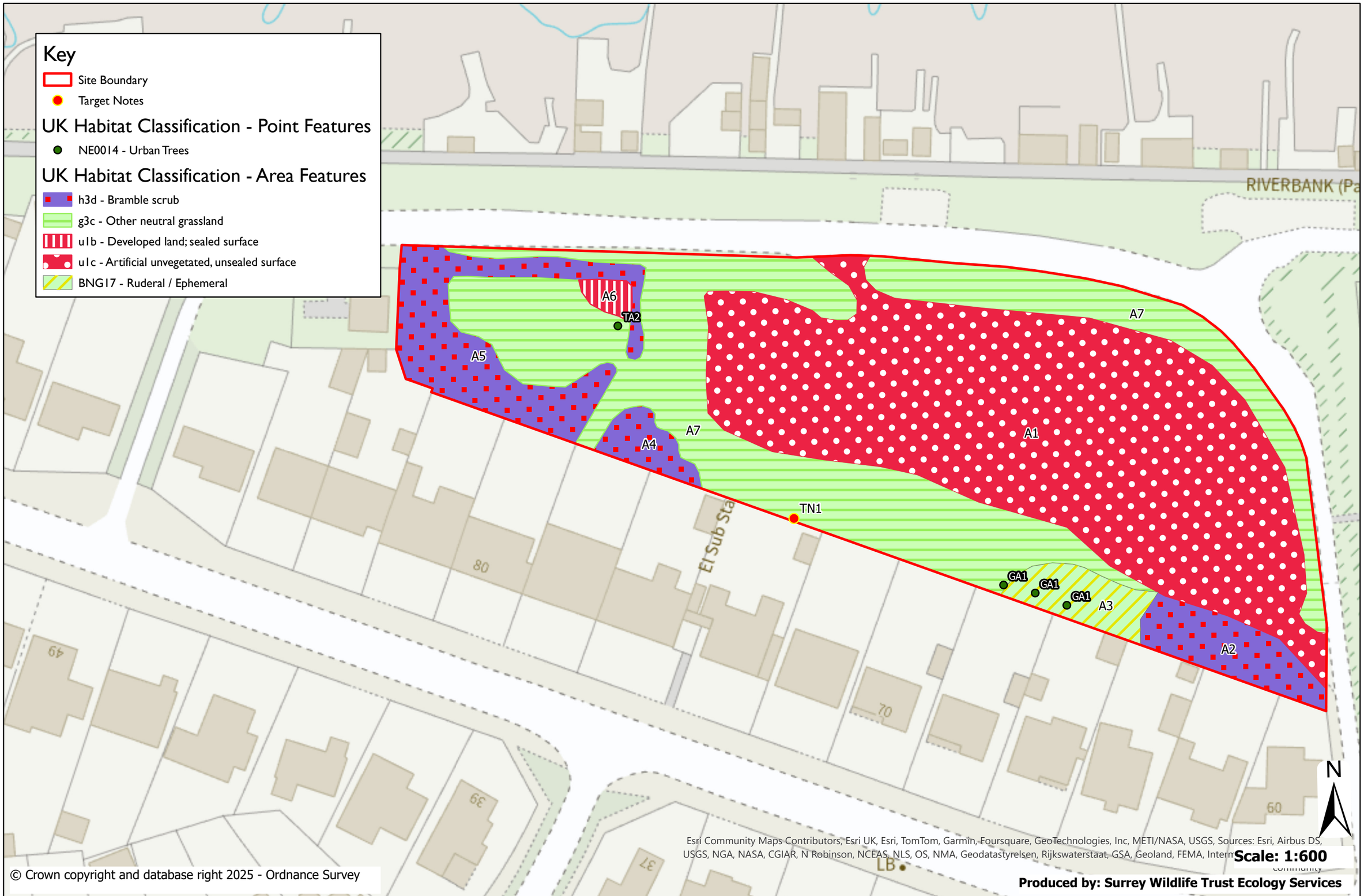

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6292, 19/02/2025

Figure 8: Site A - Car Park, Beach Green UK Habitat Classification Baseline: Potential Site Allocation

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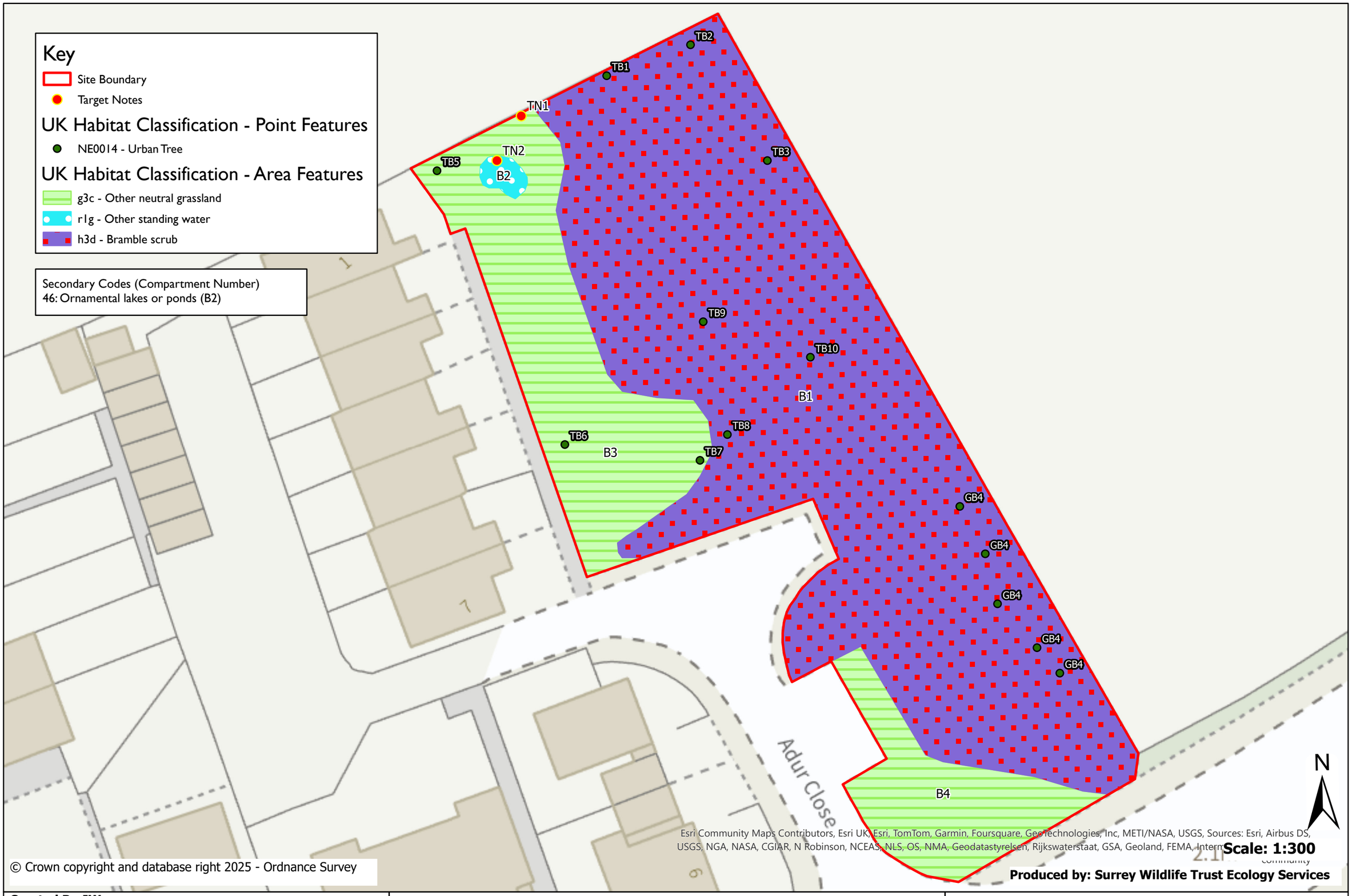
Ecology Services



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Map Revision Number:9.3
BNG Version Number:1.0
6292, 19/03/2025

Figure 9: Site B - Land East of Adur Close UK Habitat Classification Baseline Potential Site Allocation

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Key

Site Boundary

UK Habitat Classification - Point Features

NE0016 - Rural Tree

UK Habitat Classification - Linear Features

h2a - Hedgerow
h2a5 - Species Rich Native Hedgerow
r1g - Other Standing Water
w1 - Line of Trees

UK Habitat Classification - Area Features

h3d - Bramble scrub
h3h - Mixed scrub
u1b5 - Buildings
w1f7 - Other Lowland mixed deciduous woodland
g3c - Other neutral grassland
w1g - Other broadleaved woodland
u1b6 - Other developed land
f2f - Other wetlands
w1f - Lowland mixed deciduous woodland
u1c - Artificial unvegetated, unsealed surface
g3a6 - Other Lowland Dry Acid Grassland
BNG17 - Ruderal / Ephemeral
BNG21 - Traditional Orchard
f2d - Aquatic Marginal Vegetation
g3c - 19 - Other Neutral Grassland - Coastal and Floodplain Grazing marsh

Secondary Codes (Compartment Number)
33: Line of Trees (C3)
50: Ditch (C11 & C16)
11: Hedgerow with trees (C11)
55: Floodplain Wetland Mosaic

Scale: 1:2,500

Produced by: Surrey Wildlife Trust Ecology Services

Created By:JW
Map Revision Number:10.4
BNG Version Number:1.0
6292, 19/03/2025

Figure 10: Site C - Lancing Meadows UK Habitat Classification Baseline Potential Site Allocation

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Key

- Site Boundary
- Target Notes

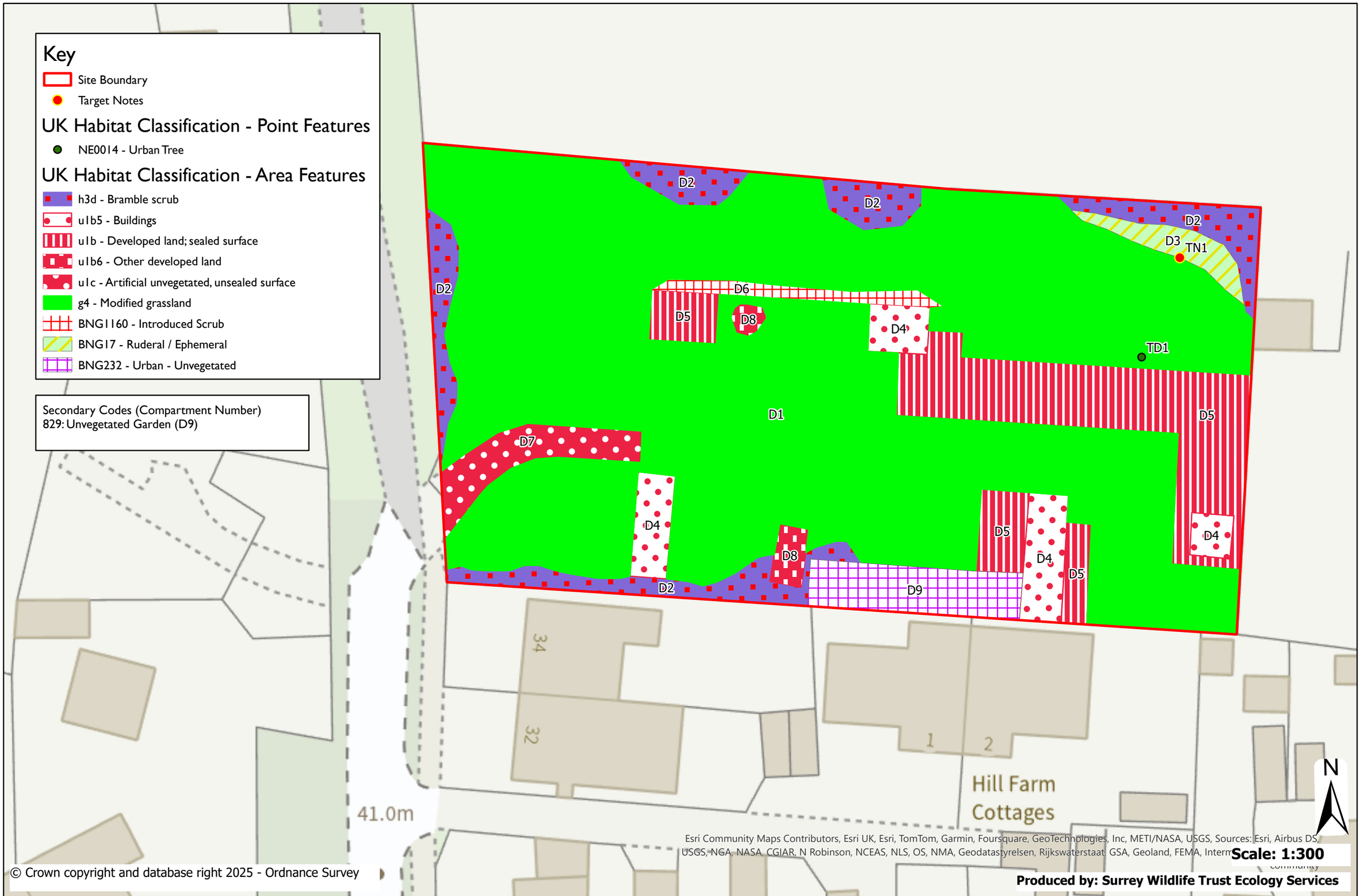
UK Habitat Classification - Point Features

- NE0014 - Urban Tree

UK Habitat Classification - Area Features

- h3d - Bramble scrub
- u1b5 - Buildings
- u1b - Developed land; sealed surface
- u1b6 - Other developed land
- u1c - Artificial unvegetated, unsealed surface
- g4 - Modified grassland
- BNG1160 - Introduced Scrub
- BNG17 - Ruderal / Ephemeral
- BNG232 - Urban - Unvegetated

Secondary Codes (Compartment Number)
829: Unvegetated Garden (D9)



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Created By:JW
Map Revision Number:11.3
BNG Version Number:1.0
6292, 19/03/2025

Figure 11: Site D - Land North of Hill Farm Way
UK Habitat Classification Baseline
Potential Site Allocation

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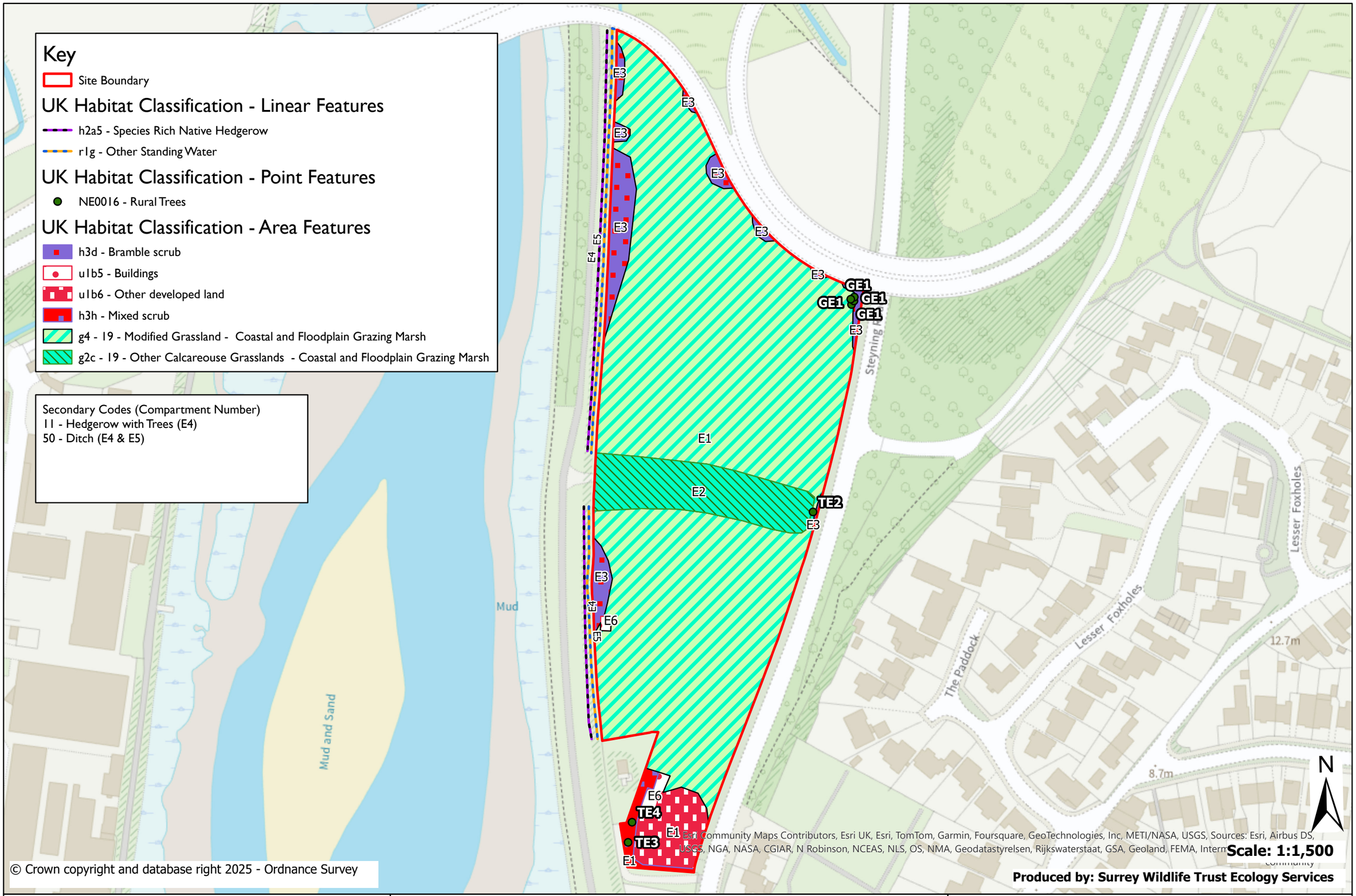
Ecology Services



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Created By:JW
Map Revision Number:12.5
BNG Version Number:1.0
6292, 19/03/2025

Figure 12: Site E - Shoreham Gateway UK Habitat Classification Baseline Potential Site Allocation

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Key

Site Boundary

UK Habitat Classification - Linear Features

h2a5 - Species Rich Native Hedgerow

UK Habitat Classification - Point Features

NE0016 - Rural Tree

UK Habitat Classification - Area Features

h3d - Bramble scrub

g4 - Modified grassland

u1b5 - Buildings

13.7m

Sompting By-Pass

Lambleys Lane

Upton Farm House

Upper Brighton Road

8.8m

F1

F2

F3

F4

F5

TF2

TF3

TF4

TF7

GF1

GF5

GF6

N

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Scale: 1:572

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Created By: JW
Map Revision Number:13.4
BNG Version Number:1.0
6292, 19/03/2025

Figure 13: Site F - Land at Upton Farmhouse UK Habitat Classification Baseline Potential Site Allocation

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Key

Site Boundary

UK Habitat Classification - Point Features

NE0016 - Rural Tree

UK Habitat Classification - Linear Features

r1g - Other Standing Water

w1 - Line of Trees

UKHabCode

u1b5 - Buildings

h3d - Bramble scrub

h3h - Mixed scrub

u1c - Artificial unvegetated, unsealed surface

laFeatureT

BNG1160 - Introduced Scrub

BNG17 - Ruderal / Ephemeral

BNG231 - Urban Vegetated Garden

NE0015 - Bare Ground

g3c - 19 - Other Neutral Grassland - Coastal and Floodplain Grazing Marsh

w1f7 - Other Lowland Mixed Deciduous Woodland

Secondary Codes (Compartment Number)
510: Bare Ground (G5)
50: Ditch (G8,G9,G17 & G19)
33: Line of Trees (G16)

Scale: 1:900

Produced by: Surrey Wildlife Trust Ecology Services

Created By: JW
Map Revision Number:14.5
BNG Version Number:1.0
6292, 19/03/2025

Figure 14: Site G - Land East of Manor Close UK Habitat Classification Baseline Proposed Site Allocation

Surrey Wildlife Trust Ecology Services

2 Introduction

2.1 Background

2.1.1 The Council is preparing a new local plan to cover a 15-year period from 2026 to 2041. As part of the evidence base to inform the emerging plan, the Council commissioned SWT Ecology Services to complete the following scope of work:

- To map the existing Habitats of Principal Importance within the Adur Local Plan area (hereinafter referred to as "the study area" area), including any other sites of importance including Statutory & Non-statutory designated sites.
- To assess a selection of three sites provided by Adur Council, for their potential designation as an LWS.
- To assess eight sites for their suitability for allocation for development in the study area, as provided by Adur Council. This included:
    - UK Habitat Classification surveys of the eight sites, hereinafter referred to as the "potential site allocations".
    - To undertake baseline assessment for BNG and calculations for a series of the potential site allocations 'typologies' and modelling that can be used to determine the overall likely off-site BNG capacity required for the local plan area.
    - To identify where ecologically valuable corridors are present in these sites and the study area.
    - To identify the suitable of any potential site allocations to support protected species.
    - To identify any potential site allocations (or parts of these sites) where the mitigation hierarchy would suggest development should be avoided.
    - To identify any potential site allocations (or parts of these sites) where the mitigation hierarchy would suggest the impacts of development could be mitigated or compensated.
    - To identify any onsite opportunities for habitat enhancement, through a series of modelling approaches
- To provide estimated costs for delivery of 10% and 20% of BNG, to input to a viability assessment.
- To identify areas where habitats and key wildlife corridors could be enhanced in the study area to maximise habitat connectivity across the study area and wider district to identify appropriate locations for habitat banking.
- To assess whether there is justification for requiring a higher level of Biodiversity Net Gain (BNG) than the legally mandated %, following an evidence-based desk study approach.
- To provide policy wording recommendations for the Adur Local Plan.

2.1.2 Ultimately, the aim of the study is to:

- Collate existing information to understand where the ecologically sensitive areas were across the study area (Statutory and Non-Statutory Designated Sites, Habitats of Principal Importance and core areas for nature).
- Assess the suitability of three sites in becoming Local Wildlife Sites.

- Review the feasibility of delivering a higher than mandated biodiversity net gain across the study area and provide justifications for this using modelled development across eight potential site allocations.
- Identify the implementation of the mitigation hierarchy across the proposed site allocations.
- Collate existing information to inform a connectivity analysis across the study area.
- Propose policy recommendations relating to biodiversity net gain for the Adur Local Plan.

2.1.3 This report includes the following Sections:

- Section 3: Provides context for the Adur district, reviewing the habitats present, along with high level context for the study.
- Section 4: Presents the methodology for study
- Section 5: Presents the results of the study including: identification of existing ecologically valuable areas and habitats; the assessment of the three potential location wildlife sites; the assessment of the eight potential site allocations and associated modelling BNG results and costs
- Section 6: The connectivity analysis to identify ecologically valuable corridors in the study area
- Section 7: Policy recommendations and feasibility of delivering a higher than mandated biodiversity net gain across the study area and provide justifications for this using modelled development across eight potential site allocations

3 Adur District

3.1.1 The study area comprises the Adur District, which supports a range of habitats. The River Adur flows north to south through the district. The A27 is orientated east to west to the north of the district, resulting in a small amount of the northern tip of the district being separate from the majority of the district area.

3.1.2 The area to the south of the A27 is dominated by urban habitats, with residential properties and gardens; roads and rail; commercial development; and green open spaces including amenity grasslands; Brighton City Airport; some agricultural land and pastoral fields; and riparian networks and wetland areas. However, some Habitats of Principal Importance are also present as presented in Figure 3 (JNCC, 2024).

3.1.3 Within the southern area, whilst some habitat connectivity is present, these are often isolated, which makes them more susceptible to impacts from external factors such as development and climate change. The isolation is further evident in south-western areas within the borough by the deficiency in open spaces, referred to as green infrastructure (Natural England, 2024).

3.1.4 The area to the north of the A27 is dominated by grasslands; woodlands; and arable and pastoral mosaics, with most of this area forming part of the South Downs National Park. There is access to open space, including to the National Park (Natural England, 2024).

3.1.5 The habitats within the Adur District support a range of common and widespread species, in addition to protected species and species of conservation concern. This study aims to identify and protect key areas that allow movement of species across the

landscape, to ensure the common and widespread species do not become threatened but also increase opportunities for species more susceptible to climate change and development impacts.

3.1.6 The study area is presented in Figure 1.

3.2 What are Local Wildlife Sites (LWS)?

3.2.1 LWS' are non-statutory designated sites that contain features of "substantive nature conservation value" (The Wildlife Trusts, 2018). LWS' are defined areas, "identified and selected at a county level, for their importance to nature conservation. They can be found on public and private land and can include ancient woodlands, wildflower meadows, wetlands, and hedgerows, and are often home to locally and nationally rare or threatened species and habitats. LWS' play a key role in ecological networks, they are identified using scientifically determined criteria and surveys" (The Wildlife Trusts, 2018).

3.2.2 In Sussex these sites were formerly known as Sites of Nature Conservation Importance (SNCIs). In West Sussex the LWS' are designated on a county level using guidance given by DEFRA (DEFRA, 2006), and outlined in the Sussex Local Wildlife Site Selection Criteria (Sussex Biodiversity Record Centre, 2017).

3.3 What is Connectivity?

3.3.1 Connectivity can be defined as corridors that allow species and genes to move across the landscape, and ecological processes to function uncompromised (United Nations Environment Programne, 2019). This facilitates climate adaptation at a landscape (or ecosystem) scale. Generalist species adapt readily to their surroundings, whilst specialists require very specific habitat conditions to facilitate movement across the landscape. Therefore, delivering good connectivity requires a mosaic of habitats that can be used by both generalist and specialist species, with wide-ranging comparative mobility.

3.3.2 Connectivity does not have to be continuous, but can include 'stepping-stones' habitats, that reduce extensive areas of built-up areas without opportunities for wildlife (Lawton, 2010).

3.4 What is Biodiversity Net Gain (BNG)?

3.4.1 BNG is a process applied to a project that aims to deliver a net positive change in biodiversity throughout a project lifecycle by implementing principles and rules (DEFRA, 2024a) (CIEEM, CIRIA, IEMA, 2019) (BSI, 2021). The Environment Act 2021 requires new development to deliver a minimum of 10% biodiversity net gain.

3.4.2 To deliver a net gain in biodiversity, the following rules must be adhered to:

- Rule 1: Trading rules must be followed.
- Rule 2: Biodiversity unit outputs, for each type of unit, must not be summed, traded or converted between types and at least 10% gain applies to each type of unit (e.g. habitats, hedgerows and watercourses).
- Rule 3: To accurately calculate the gains, the statutory biodiversity metric calculation tool, or small sites biodiversity metric tool where applicable, must be used.
- Rule 4: In exceptional circumstances, deviation from the biodiversity net gain metric methodology may be permitted by the relevant planning authority.

3.4.3 Nine principles, detailed in the statutory guidance, underpin the biodiversity metric tool.

3.4.4 The Local Planning Authority must take account how a development has implemented the Biodiversity Gain Hierarchy, as set in Town and Country Planning (Development Management Procedure) (England) Order 2015 (Ministry of Housing, Communities and Local Government, 2024), which is to:

- **Avoid** impacts where possible through careful project design, and specifically to habitats that have a medium, high and very high distinctiveness.
- **Minimise** impacts where these cannot be avoided, prioritising the minimisation in order of distinctiveness.
- **Restore** habitats that are retained or could be impacted by the project.
- As a last resort, **compensate** for the loss or damage of habitats through habitat creation primarily within the red line boundary, and if this is not possible, offsite compensation can be considered. Where offsite offsets are considered, these should be as close as possible to the impact site.

3.4.5 Biodiversity net gain assessments are undertaken using a statutory biodiversity net gain metric (DEFRA, 2024a).

4 Methods

4.1.1 This study includes multiple elements with several, sometimes overlapping, methods.

4.1.2 Table 1 presents a summary of the scope of work, with a reference to the report section/appendix where the detailed survey methods and results are provided.

Table 1: Scope of works and methods/results reference

Aim	Description	Methods
1	To map the ecologically sensitive areas across the study area within the study area, including statutory and non-statutory designated sites, and HPIs, ancient woodland, veteran trees and watercourses	Section 5: Results Appendix 1: Desk Study
2	Assessment of three sites for their potential suitability for designation as LWS	Section 5: Results Appendix 2: LWS suitability
3	To undertake UK Habitat Classification surveys of a selection of eight sites which are being assessed for their suitability for allocation for development in the study area.	Section 5: Results Appendix 1: Desk study Appendix 3: Habitat survey
4	To identify any potential site allocations (or parts of sites) where the mitigation hierarchy would suggest development should be avoided.	Section 5: Results Appendix 1: Desk study Appendix 3: Habitat survey Appendix 4: BNG assessment
5	To identify any potential site allocations (or parts of sites) where the mitigation hierarchy would suggest the impacts of development could be mitigated or compensated.	Section 5: Results Appendix 1: Desk study Appendix 3: Habitat survey Appendix 4: BNG assessment
6	To identify any onsite opportunities for habitat enhancement within potential site allocations.	Section 5: Results

Aim	Description	Methods
		Appendix 3: Habitat survey Appendix 4: BNG assessment
7	To undertake baseline assessment for BNG and calculations for a series of potential site allocations 'typologies' and associated models that can be used to determine the overall likely off-site BNG capacity required for the local plan area.	Section 5: Results Appendix 4: BNG assessment
8	To provide estimated costs for delivery of 10% BNG and any suggested higher level of BNG, to input to a viability assessment.	Appendix 4: BNG assessment Section 5 and 7
9	To identify areas where habitats and key wildlife corridors can be enhanced in Adur to maximise habitat connectivity across the local plan area and wider district to identify appropriate locations for habitat banking.	Sections 5 and 6 Appendix 5: Connectivity Analysis
10	To provide policy wording recommendations for the Adur Local Plan	Section 7

5 Results

5.1 Review of areas of ecological importance within Adur LPA

Statutory designated sites

5.1.1 There are four statutory designated sites within the study area, consisting of one SSSI and three LNRs. These sites have riparian, coastal, estuarine, wetland, woodland and grassland habitats; these are presented in Figure 2 and discussed in detail in Table 2 below. The context of the potential site allocations in relation to the designated sites is presented in Section 5.3 and Appendix 1 of this report.

Non-statutory designated sites

5.1.2 There are seven non-statutory sites within the Adur Local Plan study boundary, including six LWS' and one RSV. These sites have riparian, coastal, estuarine, wetland, woodland, downland, scrub and grassland habitats; these are presented in Figure 2 and discussed in detail in Table 2 below. The context of the potential allocation sites in relation to the designated sites is presented in Section 5.3 and Appendix 1 of this report. There are also areas of LGS, however these sites are not considered as part of this assessment.

5.1.3 As demonstrated on Figure 2, there are no areas of ancient woodland within the study area.

BOAs

5.1.4 There are three BOAs with boundaries that fall within the study area. These BOAs have saltmarsh, grazing marsh, mudflats, chalk downland, chalk springs that flow from this downland, and lowland calcareous grassland The BOAs present are discussed in detail in Table 2 below and presented in Figure 3. The context of the potential site allocations in relation to the BOAs is presented in Section 5.3 and Appendix 1 of this report.

5.1.5 The following HPI habitats are within the study area:

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal vegetated shingle
- Lowland mixed deciduous woodland
- Intertidal mudflats
- Saline lagoons
- Traditional orchard
- Wood-pasture and parkland

5.1.6 Furthermore, within the study area there are also areas where the habitat type present is not known, however as defined by JNCC, there is potential for fragmented areas of a HPI habitat to be present, or habitat that has potential to be restored to HPI habitat type and/or contribute to ecological networks (JNCC, 2024).

5.1.7 The Woodlands Trust Ancient Tree Inventory lists five veteran trees recorded within the study area (Woodland Trust, Accessed 24/02/2025), however it should be noted that there may be more ancient or veteran trees within the study area that have not been recorded.

5.1.8 The River Adur, which falls within the Adur Estuary SSSI, flows through the centre of the study area and supports several associated riparian, estuarine and coastal habitats within the mouth of the river basin.

5.1.9 An extensive ditch and drain network is present throughout the study area in addition to several freshwater lakes and ponds, and saline and brackish lagoons and lakes.

Table 2: Statutory; non-statutory sites; and BOAs within Adur LPA

Site name	Reasons for designation	Grid reference
Statutory Designated Sites		
Adur Estuary SSSI	The Adur Estuary, and Rye Harbour, represent the only significant areas of saltmarsh between Chichester and Pagham Harbours in West Sussex, and Sandwich Bay in Kent. The estuarine plant communities are unusual due to the relative scarcity of cord-grass, *Spartina spp*. The intertidal mudflats within the estuary are important for a variety of wading birds. Saltmarsh plants fringe most of the estuary and in places have colonised large areas of mudflats. The intertidal mudflats of the Adur Estuary support a number of wading birds, particularly redshank, dunlin and ringed plover. The number of ringed plover regularly exceed 1% of the total British population, making the estuary of national importance for this species. A variety of species breed within the reedbed adjacent to the estuary north of the A27, including moorhen, reed warbler and sedge warbler. The estuary embankment supports a large colony of viviparous lizards.	TQ 208 056
Shoreham Beach LNR	This site is an Urban Fringe LNR situated off the main A259 Brighton Road, Shoreham-by- Sea. The vegetated shingle on this beach is an internationally rare habitat that contains such plants as Yellow Horned Poppy, Sea Kale and Curled Dock. These plants encourage a wealth of wildlife to the beach.	TQ 219 044
Widewater Lagoon LNR	This site is an Urban Fringe LNR situated at Brighton Road, Lancing to the north-west of Shoreham Beach. Widewater is a shallow micro-tidal lagoon which is an area of brackish water landlocked by a man-made shingle bank. It is home to herons, swans, geese, cormorants, kingfishers, gulls, and other wildfowl.	TQ 199 041
Lancing Ring LNR	This site is an Urban Fringe LNR, it is on, but outside of the study area. This site is important for its chalk grassland, a rare and diverse habitat. This chalk grassland site is notable for butterflies, adders, and common lizards. There is also deciduous woodland with wildflowers including early purple orchids and a dew pond, the habitat of dragonflies such as the broad-bodied chaser, and numerous newts	TQ 182 062
Non-statutory Designated Sites		
Shoreham Beach LWS	This LWS is the site as for the Shoreham Beach LNR above, but with a longer and narrower boundary. It has vegetated shingle habitat with notable rare flora	TQ 219 044
Widewater Lagoon LWS	This LWS is the site as for the Widewater Lagoon LNR above. The site is a brackish isolated spit lagoon with saltmarsh and vegetated shingle banks providing habitat for notable flora and wintering birds.	TQ 199 041
Lancing Ring LWS	This LWS is the site as for the Lancing LNR above, however it's western boundary incorporate a greater extent of the woodland habitat. This site has a habitat mosaic of ash woodland, scrub, chalk pit, pasture and rank grassland with interesting herbaceous flora and notable butterfly and insect populations	TQ 182 062
Cokeham Brooks LWS	Cokeham Brooks comprises wetland, grassland and woodland habitats on the edge of urban Sompting in West Sussex. The site contains numerous springs that flow into the Cokeham Brook stream and give rise to botanically rich wetland habitats including a feature known locally as flushed fen. Notable habitats include reedbed and a small block of lowland mixed deciduous woodland which are both NERC section 41 and Sussex BAP habitats. The wetland habitats also support a diversity of notable invertebrate and breeding bird species.	TQ 165 041
Mill Hill LWS	This LWS is located to the north of study area, by the Shoreham bypass, extending northwards outside of the study area boundary. This site has unimproved herb rich downland with notable herb and moss flora and butterfly populations	TQ 211 069
Sidehill Scrub LWS	This LWS is located to the east of the study area by Southwick hill recreation ground, extending north-eastward outside of the LPA boundary. The site has mixed scrub on an urban fringe with a notable specimen of Wych Elm	TQ 248 066
Shoreham Bypass NRV	This NRV is present on the north and south of the A27, east of the Shoreham Bypass. It partly overlaps with Mill Hill LWS to the west. Notable species include Small Blue and Kidney Vetch.	TQ 224 066
BOAs		
Shoreham Estuary and Beach BOA	This BOA includes Widewater Lagoon LNR & LWS; Shoreham Beach LNR & LWS; and the southern extent of Adur Estuary SSSI and incorporates other areas outside of these designations. The BOA covers approximately 136 ha. This area is dominated by saltmarsh, grazing marsh and mudflats and their associated brackish communities. Shoreham Beach has some of the best vegetated shingle in the county despite high visitor pressure. There is also a saline lagoon and estuary, important for wading birds.	TQ208048
Adur to Newtimber including Mill Hill BOA	The southern most section of this BOA is within the study area, just east of the Shoreham bypass. The BOA runs from Mill Hill and Old Erringham Farm in the West along the edge of the chalk to Saddlecombe, Devils Dyke and Waterhall in the East. The majority of the chalk downland in this area is owned and managed by the National Trust. There is a high density of chalk grassland habitat and several chalk springs that flow from this downland.	TQ244105
Crooked Moon to Thundersbarrow	Part of this BOA falls within the north west of the study area boundary. This area runs across the A27 from Rest and Be Thankful up to Thundersbarrow hill. The North of the area has a significant amount of lowland calcareous grassland. A large proportion of this BOA is owned and managed by the National Trust.	TQ238074

5.2 Review of Potential Local Wildlife Sites

5.2.1 The detailed methods and results for the review of potential LWS's are provided in Appendix 2. A summary of the results is provided in the Tables below.

Table 3: Sompting Brooks Potential LWS Review

Site name	Sompting Brooks
Grid Reference	TQ1604 0526
Area (ha)	7.17
Ownership	Sompting Estate, Mike Tristram
Does the site meet the Sussex Local Wildlife Site Selection Criteria (Sussex Local Wildlife Site Initiative, 2017)?	The site may meet the following criteria; CH2 - Habitat of Principal Importance in England • A river (HPI) is present CS1 – Species criteria • The notable bird and invertebrates recorded on the site as well as the presence of harvest mouse will contribute towards the eligibility of the site under the habitat criteria The site is likely to meet the following criteria; CH6 – Mosaic habitats • This site would be an extension to the Cokeham Brooks LWS which lies immediately adjacent to the south and east. This site could support similar habitats to that supported within the Cokeham Brooks LWS including botanically rich wetland, grassland and trees on the banks of the Cokeham Brook Stream. CH8 – Site expansion • The site lies immediately adjacent to the Cokeham Brooks LWS. It is being managed as part of a wider conservation area in conjunction with Cokeham Brooks.
Supporting features	This site is particularly important for the following DEFRA Local Sites Guidance selection criteria; • Connectivity within the landscape (adjacent to LWS and also forms part of an important connectivity corridor within the landscape) • Value for appreciation of nature and learning

Table 4: Silver Sands Potential LWS Review

Site name	Silver Sands
Grid Reference	TQ2304 0788
Area (ha)	2.2
Does the site meet the Sussex Local Wildlife Site Selection Criteria (Sussex Local Wildlife Site Initiative, 2017)?	The site is likely to meet the following criteria; CH2 – Habitat of Principal Importance in England • Defra mapping shows the majority of the site as HPI habitat: intertidal mudflats. The final decision on whether this is a 'significant' area of HPI habitat would need to be made by the LWS Technical Panel. CH6 – Mosaic habitats • The site supports a mosaic of habitats including mudflat, sand, shingle and good quality semi-improved grassland habitat (non-HPI). • The site could extend the area of protected mudflat habitat along the River Adur estuary corridor which runs from the Adur Estuary SSSI. CH7 – Wildlife Corridors • Although this site does not link two or more LWS', it does form part of a corridor/stepping stones of mudflat habitat leading to the east from the Adur Estuary SSSI. CH8 – Site expansion • If selected as a LWS, the site would expand the protected area of mudflat habitat along a corridor leading from the Adur Estuary SSSI. CS1 – Species criteria The site supports a population of Childing pink, *Petrorhagia nanteuilii*. This is rare both nationally and in Sussex. There have also been records of a number of other notable plants, birds and invertebrates on the site
Supporting features	• Rare or exceptional feature • Fragility • Connectivity within the landscape; forms part of an important connectivity corridor within the landscape • Value for appreciation of nature

Table 5: North Canal Bank Potential LWS Review

Site name	North Canal Bank
Grid Reference	TQ2494 0504
Area (ha)	1.79
Does the site meet the Sussex Local Wildlife Site Selection Criteria (Sussex Local Wildlife Site Initiative, 2017)?	The site may meet the following criteria; CH2 - Habitat of Principal Importance in England • Unlikely - An up to date habitat survey is required to determine whether any HPIs are present on the site. Possible HPIs include coastal vegetated shingle, lowland meadow and/or lowland calcareous grassland. However if present, these are only likely to be present over very small areas. CH6 – Mosaic Habitats • Unlikely - The site supports a good mosaic of habitats. Whether the site meets this criterion will depend on the value and extent of the habitats as determined by an up to date habitat survey. CS1 – Species criteria • A survey in 2009 found the site to support an exceptional population of common lizard, *Zootoca vivipara* and a good population of slow-worm *Anguis fragilis*. There are records of two notable plant species on the site and the nationally scarce grey bush cricket *Platycleis albopunctata* (See Appendix 2C for details).
Supporting features	• Connectivity within the landscape, particularly to the each which shows a key connectivity corridor where there is currently an area of dispense development within the study area

5.3 Assessment of Potential Site Allocations

5.3.1 A UK habitat survey and condition assessment was completed of eight potential site allocations. A baseline BNG assessment was completed for each of the sites, with three different post-development scenarios modelled. The unit short fall from each post development model, was used to calculate the approximate cost of achieving a 10% and 20% BNG through offsite offsetting, based on average unit costs by habitat (Biodiversity Units UK and Arbtec, 2024).

5.3.2 The full methodology and results of the UK Habitat survey and condition assessment are provided in Appendix of 4. The methodology of the BNG assessment and modelling is provided in Appendix 4 of this report. The full BNG assessments, including baseline and the three different post-development models and condition assessment sheets have been provided in a separate document to this report.

5.3.3 The tables below provide the assessment of each of the potential sites, for their suitability to be allocated for development; specifically, each table provides the following:

- Site name.
- Site area (ha).
- Site baseline habitat map.
- Baseline habitats present.
- Baseline habitat, hedgerow and watercourse units.

- Post-development habitat units under Model 1, Model 2 and Model 3.
- Unit shortfall for reaching a 10% and 20% BNG, under each of the post-development model.
- Approximate cost of achieving a 10% and 20% BNG, for each model, through off-site offsetting.
- An overview of the potential site allocations, including identification of any ecologically sensitive areas in the site, such as but not limited to proximity to statutory and non-statutory designated areas, HPI's and key connectivity corridors in the Adur Local Plan area.
- Which potential fauna species/species groups the habitats on site have suitability for.
- Application of the mitigation hierarchy.

Summary of the potential site allocations

5.3.4 As evidenced below, Site C: Lancing Meadows, supports the highest number of biodiversity units, supporting multiple HPIs. The presence of these HPIs results in significant development constraints. Any losses in HPI habitat that could not be offset on site, would require an offsite offset. The cost of offsetting HPI habitat would be significant given these higher value habitats are harder to create and require additional resources. HPI is also present in Site E: Shoreham Gateway and Site G: Land East of Manor Close. Whilst Site H: Land at Mill Hill does not support HPI within the site boundary, it is adjacent to lowland mixed deciduous woodland, and a buffer should be incorporated between the habitat and any development.

5.3.5 Whilst within the site boundary, Site A: Car Park, Beach Green has low ecological constraints, it is situated adjacent to the Adur Estuary SSSI and any development impacts would need to be appropriately mitigated to avoid impacts to the SSSI. Based on the connectivity analysis, the site does not support critical connectivity but is adjacent to a connectivity corridor, which connects to the potential North Canal LWS

5.3.6 Site Allocations with the lowest ecological constraints include:

- Site B: Land East of Adur Close due to the relatively common habitats present, and lack of connectivity within the wider landscape.
- Site D: Land North of Hill Farm Way due to the presence of habitats of low ecological value, although is adjacent to the South Downs National Park and is within the Crooked Moon to Thundersbarrow BOA. This increases opportunities for enhancement.
- Site F: Land at Upton Farm: although hedgerow HPI is present along the northern boundary, this provides opportunities for enhancement and retention, whilst the remaining habitats are of low ecological constraint.

5.3.7 Generally, habitat that should be avoided if developing any of these site allocations include (in order of priority):

- HPI
- High distinctiveness habitats (included watercourses)
- Habitats supporting protected species or species of conservation concern
- Medium distinctiveness habitats
- Individual trees

5.3.8 Should any of the sites be allocated for development, sensitive design incorporating the semi-natural habitats wherever possible should be prioritised. Measures to minimise impacts such as avoiding sensitive construction measures should be explored. Incorporating dark corridors, that also provide movement opportunities for species would benefit connectivity across the landscape. This could be achieved by planting species-rich hedgerows and hedgehog highways. Where dark corridors cannot be incorporated sensitive lighting strategies, in line with best practice guidance will need to be developed (Bat Conservation Trust and Institute of Lighting Professionals, 2023).

5.3.9 Opportunities for enhancement exist for all the potential site allocations. These include planting additional urban trees, native hedgerows and mixed scrub, which would provide ecological benefits, in addition to delivery of other ecosystem services (e.g. urban cooling, water retention etc). Where sites are located within or adjacent to BOAs (Site A: Car Park, Beach Green, Site D: Land North of Hill Farm Way, Site E: Shoreham Gateway) a review of the BOA priorities should be undertaken and enhancement or habitat creation focussed on the BOA objectives to ensure a strategic approach to habitat improvements is taken to maximise positive gains for biodiversity.

Table 6: Site A: Car Park Beach Green Site Allocations Assessment

Site Name	Site A: Car Park, Beach Green					
Sie Area (ha)	0.7088					
Habitats present at baseline	Ruderal/Ephemeral Other neutral grassland Bramble scrub Developed land; sealed surface Artificial unvegetated, unsealed surface Urban trees					
Baseline Units	**Habitats**		**Hedgerow**		**Water course**	
	4.05		0.00		0.00	
BNG modelling results	***Model 1***		***Model 2***		***Model 3***	
Post development habitat units	1.91		1.78		2.51	
% BNG in habitat units	-52.82%		-56.19%		-38.09%	
Target BNG	***10%***	***20%***	***10%***	***20%***	***10%***	***20%***
Unit shortfall	5.09	5.90	5.37	6.18	3.90	4.71
Approximate cost of meeting BNG	£153,879.89	£178,376.90	£160,567.35	£184,825.13	£117,816.43	£142,313.44
Site Overview	Site A is the third smallest potential allocation sites. It falls within the Shoreham Estuary and Beach BOA, and immediately south of the Adur Estuary SSSI. Black poplar may be present within this site and further investigation is recommended to establish the species. No HPIs are present. Based on the connectivity analysis, the site does not support critical connectivity but is adjacent to a connectivity corridor, which connects to the potential North Canal LWS (see Figure 7). There is therefore scope to review the habitats providing connectivity in the wider landscape and where restoration or creation occurs, align with these to benefit species in the local area. It should be noted that this site falls within Flood Zones 2 and 3 (GOV.UK, Accessed 13/03/2025)					
Fauna suitability	Amphibians (in their terrestrial phase); badger; bats (foraging, commuting and roosting bats); birds (nesting); hedgehog; invertebrates; reptiles; and other mammals (such as rabbit and fox).					
Impacts that could be avoided	Where possible, avoid the loss of semi-natural habitat, including urban trees and other neutral grassland.					
Impacts that could be mitigated or compensated for	Consideration to the presence of the SSSI north of the site will need to be made in developing a mitigation strategy. Should protected species, and species of conservation concern be present, if developed the site would not be able to support a viable population of ground-dwelling species (e.g. reptiles, hedgehogs), given the presence of developed land. As such, a bespoke mitigation strategy will need to be developed, which could include translocation as a last resort. Inclusion of integrated bird (specifically swift) and bat boxes will benefit biodiversity, in addition to a lighting strategy that maintains a dark corridor. Other features, such as hedgehog highways could be considered.					
Opportunities for enhancement	Bramble scrub enhanced to species-rich mixed scrub of good condition, and improvement of other neutral grassland from moderate to good condition. Planting additional urban trees would provide ecological benefits, in addition to delivery of other ecosystem services (e.g. urban cooling, water retention etc).					

Baseline habitat map

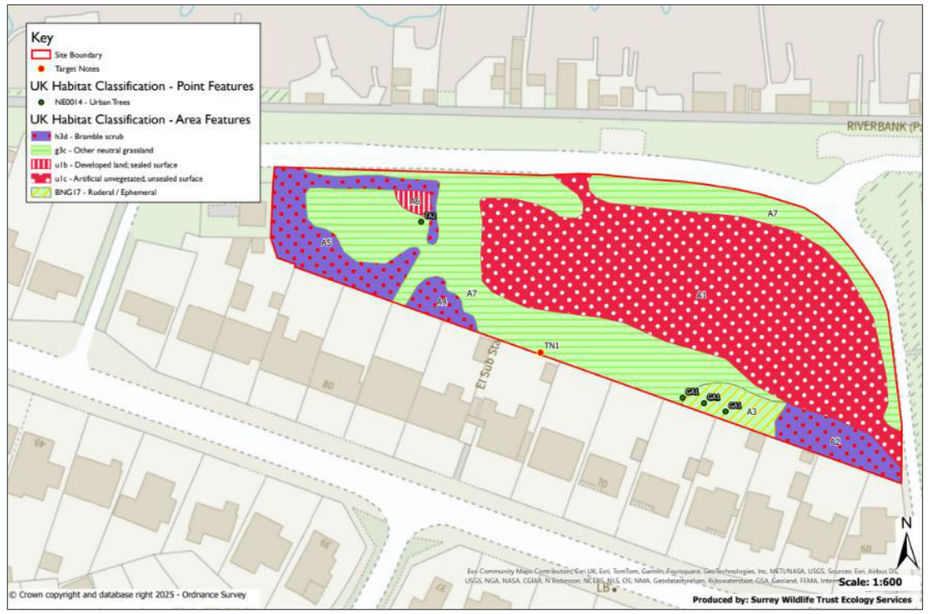


Table 7: Site B: Land East of Adur Close Site Allocations Assessment

Site Name	Site B: Land East of Adur Close						Baseline habitat map
Sie Area (ha)	0.1895						
Habitats present at baseline	Other neutral grassland Bramble scrub Ornamental lake or pond Urban trees						
Baseline Units	Habitats		Hedgerow		Water course		
	3.00		0.00		0.00		
BNG modelling results	*Model 1*		*Model 2*		*Model 3*		
Post development habitat units	2.27		2.23		2.43		
% BNG in habitat units	-24.24%		-25.47%		-18.92%		
Target BNG	*10%*	*20%*	*10%*	*20%*	*10%*	*20%*	
Unit shortfall	2.05	2.65	2.13	2.73	1.73	2.33	
Approximate cost of meeting BNG	£69,003.26	£89,153.77	£71,468.33	£91,618.84	£58,270.14	£78,420.65	
Site Overview	Site B is the smallest of the eight potential site allocations. It does not fall within in any statutory or non-statutory designations, or BOA. No HPIs are present within this site, although it does fall within an area mapped as non-priority good-quality semi-improved grassland; this means that it has been identified to support grassland habitat that has potential to be restored to HPI type and/or contribute to a key ecological network. The connectivity analysis indicates that this site does not provide notable connectivity in the study area boundary, and it is located within a wider area where there is low resistance to species movement (see Figure 6 and 7). The site is dominated by dense bramble scrub and other neutral grassland and has a pond. In addition, it is located in an area dominated by pastoral grasslands and residential development, and these habitats may provide an important resource for a range of fauna in an area of the district where these habitats are relatively scarce. It should be noted that this site falls within Flood Zones 2 and 3 (GOV.UK, Accessed 13/03/2025).						
Fauna suitability	Amphibians (breeding and in their terrestrial phase); badger; bats (foraging, commuting and roosting bats); birds (nesting); hazel dormouse; hedgehog; invertebrates; reptiles; and other mammals (such as rabbit and fox).						
Impacts that could be avoided	Where possible, avoid the loss of semi-natural habitat and urban trees, scrub and grassland habitat and ensure that these habitats are retained/enhanced at the sites boundaries to maintain connectivity.						
Impacts that could be mitigated or compensated for	Should protected species and species of conservation concern be present, if developed the site would not likely be able to support a viable population of ground-dwelling species (e.g. reptiles, hedgehogs), given the presence of developed land. As such, a bespoke mitigation strategy will need to be developed, which could include translocation as a last resort. Inclusion of integrated bird (specifically swift) and bat boxes will benefit biodiversity, in addition to a lighting strategy that maintains a dark corridor. Other features, such as hedgehog highways could be considered.						
Opportunities for enhancement	Bramble scrub enhanced to mixed scrub of good condition, and improvement of other neutral grassland from moderate to good condition. Planting additional urban trees would provide ecological benefits, in addition to delivery of other ecosystem services (e.g. urban cooling, water retention etc).						

Table 8: Site C: Lancing Meadows Site Allocations Assessment

Site Name	Site C: Lancing Meadows					
Sie Area (ha)	13.46					
Habitats present at baseline	Ruderal/Ephemeral Traditional orchard Other lowland acid grassland Other neutral grassland Bramble scrub Mixed scrub Developed land; sealed surface Artificial unvegetated, unsealed surface		Lowland mixed deciduous woodland HPI Other woodland; broadleaved Rural trees Floodplain wetland mosaic HPI Coastal and floodplain grazing marsh HPI Hedgerows Line of trees Ditch			
Baseline Units	Habitats		Hedgerow		Water course	
	175.85		1.83		0.96	
BNG modelling results	*Model 1*		*Model 2*		*Model 3*	
Post development habitat units	12.17		9.57		23.50	
% BNG in habitat units	-93.05%		-94.53%		-86.56%	
Target BNG	*10%*	*20%*	*10%*	*20%*	*10%*	*20%*
Unit shortfall	360.79	395.80	365.99	401.00	338.13	373.14
Approximate cost of meeting BNG	£25,224,693	£27,672,563	£25,588,573	£28,036,443	£23,640,328	£26,088,198
Site Overview	Site C is the largest of the eight potential site allocations. It does not fall within in any statutory or non-statutory designations, or BOA. However, it does support the following HPI habitats as identified on MAGIC and JNCC: Lowland mixed deciduous woodland; Coastal and floodplain grazing marsh; and Floodplain wetland mosaic. In addition, areas are mapped as non-priority good-quality semi-improved grassland. Lastly, traditional orchard has been identified onsite on a precautionary basis. Whilst it meets some of the definition of traditional orchard, it is not mapped as HPI traditional orchard on the JNCC Natural England Priority Habitat Inventory or the PTES: Traditional Orchard Inventory (People's Trust for Endangered Species, 2025). This habitat was assessed as traditional orchard on a precautionary basis owing to the sub-optimal time of the year the survey took place. Further survey is recommended at the optimal time of year to establish if this is a HPI habitat. The area of traditional orchard does fall within the lowland mixed deciduous woodland HPI boundary. The connectivity analysis indicates that this potential site allocation provides notable connectivity in the study area boundary between the north and south, and habitats in this connectivity corridor (in the east of the site, largely the HPI lowland mixed deciduous woodland and CFGM) should be retained with the opportunity to enlarge and enhance the habitats in the corridor to enhance the connectivity in this area (see Figure 6 and 7). The site falls within Flood zones 2 and 3 (GOV.UK, Accessed 13/03/2025)					
Fauna suitability	Amphibians (breeding and in their terrestrial phase); badger; bats (foraging, commuting and roosting bats); birds (wintering, farmland, woodland, nesting, barn owl); hazel dormouse; hedgehog; invertebrates; otter; reptiles; water vole and other mammals (such as harvest mouse, rabbit and fox).					
Impacts that could be avoided	Confirmed HPI habitats to be retained and enhanced. Further survey should be completed of the potential traditional orchard on site, to determine the habitat and establish if it is a HPI. Any development should protect and enhance the river and riparian corridor, and where possible, all individual trees should be protected. The site has habitats that could support a range of protected/notable species and further surveys should be completed to determine if these species are present/likely absent. Avoid impacting the habitats providing the connectivity corridor, in the east of the site (see above and Figure 6 and 7).					
Impacts that could be mitigated or compensated for	Parts of the potential site allocations without HPI habits and not directly adjacent to the riparian corridor are more suitable for development. Development in these areas could be mitigated and compensated for in areas of the site not developed; if any HPI is impacted then the mitigation/compensation would require offsetting the HPI habitat type that is lost, of better condition. Inclusion of integrated bird (specifically swift and barn owl) and bat boxes will benefit biodiversity, in addition to a lighting strategy that maintains a dark corridor. Other features, such as hedgehog highways could be considered.					
Opportunities for enhancement	Enhancement of moderate condition grasslands, woodland, CFGM, floodplain wetland mosaic; lines of trees; and hedgerows, all to good condition; enhancement of bramble scrub to species-rich mixed scrub of good condition. Planting additional rural trees, native hedgerows and species-rich mixed scrub would provide ecological benefits, in addition to improving connectivity and delivery of other ecosystem services (e.g. urban cooling, water retention etc).					

Baseline habitat map

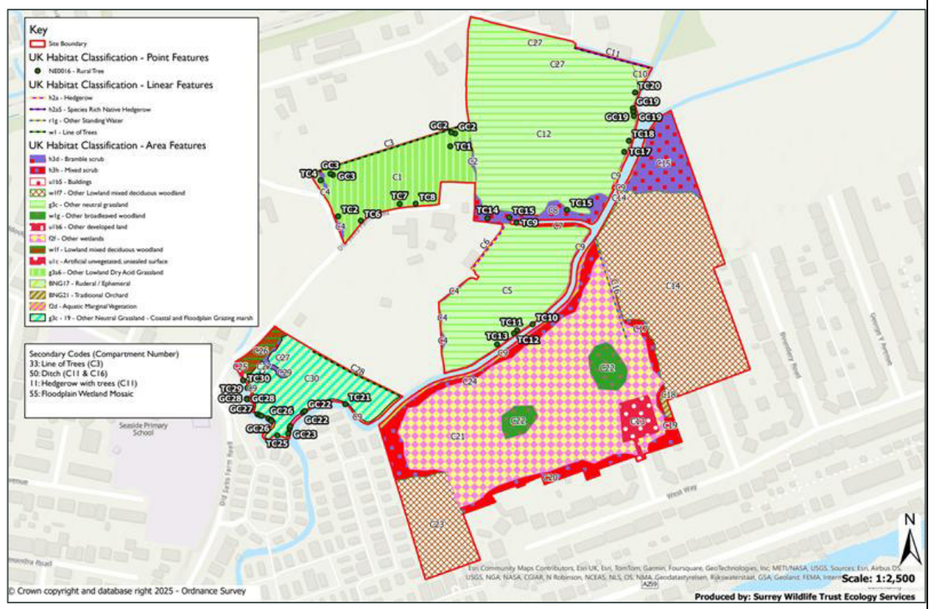


Table 9: Site D: Land North of Hill Farm Way Site Allocations Assessment

Site Name	Site D: Land North of Hill Farm Way					
Sie Area (ha)	0.2532					
Habitats present at baseline	Introduced shrub Ruderal/Ephemeral Unvegetated garden Modified grassland Bramble scrub Developed land; sealed surface Artificial unvegetated, unsealed surface Urban tree					
Baseline Units	**Habitats**		**Hedgerow**		**Water course**	
	0.96		0.00		0.00	
BNG modelling results	***Model 1***		***Model 2***		***Model 3***	
Post development habitat units	0.28		0.24		0.50	
% BNG in habitat units	-70.38%		-75.46%		-48.17%	
Target BNG	***10%***	***20%***	***10%***	***20%***	***10%***	***20%***
Unit shortfall	1.54	1.74	1.64	1.83	1.12	1.31
Approximate cost of meeting BNG	£43,116	£48,479	£45,841	£51,205	£31,201	£36,565
Site Overview	Site D is the second smallest of the eight potential site allocations. It falls outside of, but adjacent too, the southern boundary of the South Downs National Park, and lies partly within Crooked Moon to Thundersbarrow BOA. No HPIs are present within this site or other habitats of higher value for ecology. The connectivity analysis indicates that this site does not provide notable connectivity in the study area boundary However, it is also located in area where there is already a higher resistance to species movement, relative to the potential site allocations A – E.					
Fauna suitability	Amphibians (in their terrestrial phase); badger (foraging); bats (foraging, commuting and roosting bats); birds (nesting); hedgehog; invertebrates; reptiles; and other mammals (such as rabbit and fox).					
Impacts that could be avoided	Where possible, avoid the loss of semi-natural habitat, including scrub, urban trees and modified grassland.					
Impacts that could be mitigated or compensated for	Should protected species, and species of conservation concern be present, if developed the site would not be able to support a viable population of ground-dwelling species (e.g. reptiles, hedgehogs), given the presence of developed land. As such, a bespoke mitigation strategy will need to be developed, which could include translocation as a last resort. Inclusion of integrated bird (specifically swift) and bat boxes will benefit biodiversity, in addition to a lighting strategy that maintains a dark corridor. Other features, such as hedgehog highways could be considered.					
Opportunities for enhancement	Bramble scrub enhanced to species-rich mixed scrub of good condition, and enhancement of modified grassland to other neutral grassland of good condition. Planting additional urban trees and native hedgerows would provide ecological benefits, in addition to delivery of other ecosystem services (e.g. urban cooling, water retention, habitat connectivity etc).					

Baseline habitat map

Table 10: Site E: Shoreham Gateway Site Allocations Assessment

Site Name	Site E: Shoreham Gateway					
Sie Area (ha)	2.4813					
Habitats present at baseline	Coastal and floodplain grazing marsh HPI Bramble scrub Mixed scrub Developed land; sealed surface Rural trees Species-rich native hedgerow with trees Ditch					
Baseline Units	**Habitats**		**Hedgerow**		**Water course**	
	31.97		3.85		0.97	
BNG modelling results	***Model 1***		***Model 2***		***Model 3***	
Post development habitat units	2.50		2.02		4.59	
% BNG in habitat units	-92.17%		-93.67%		-85.65%	
Target BNG	***10%***	***20%***	***10%***	***20%***	***10%***	***20%***
Unit shortfall	65.33	71.72	66.29	72.68	61.88	67.55
Approximate cost of meeting BNG	£7,971,070	£8,751,247	£8,087,922	£8,868,099	£7,550,316	£8,242,260
Site Overview	Site E is the fourth largest of the eight potential site allocations. It falls within the Shoreham Estuary and Beach BOA, and just outside off the Adur Estuary SSSI. HPI Coastal and floodplain grazing marsh; and hedgerows, and ecologically valuable to species movement, are present within this site. The connectivity analysis indicates that this site provides notable connectivity, with a key connectivity corridor from east to west Adur present in the centre of the site, linking with the River Adur (see Figure 6 and 7). It is noted that towards the northern boundary of the study area boundary (where the A27 is present) there is already a higher resistance to species movement, relative to the southern boundary and movement along the River Adur north to south. To support this, it is also noted that in the north of the site there is a green corridor that goes underneath the Shoreham Bypass providing connectivity across the landscape. It should be noted that this site falls within Flood Zones 2 and 3 (GOV.UK, Accessed 13/03/2025)					
Fauna suitability	Amphibians (breeding and in their terrestrial phase); badger; bats (foraging, commuting and roosting bats); birds (wintering, farmland, woodland, nesting, barn owl); dormouse; hedgehog; invertebrates; otter; reptiles; water vole and other mammals (such as rabbit and fox).					
Impacts that could be avoided	As a priority, avoidance of impacts to HPI habitats, hedgerows and ditch and river is recommended; if any HPI is impacted then the mitigation/compensation would require offsetting the HPI habitat type that is lost, of better condition. The potential site allocations has habitats that could support a range of protected/notable species and further surveys should be completed to determine if these species are present/likely absent. Where possible, avoid the loss of semi-natural habitat, including rural trees, scrub and grassland and retention of the CFMP habitat in the central area, that provides the connectivity corridor.					
Impacts that could be mitigated or compensated for	Further protected species surveys are required to determine which species/species groups are present and what requirements for mitigation/compensation would be required to facilitate development. Inclusion of integrated bird (specifically swift and barn owl) and bat boxes will benefit biodiversity, in addition to a lighting strategy that maintains a dark corridor. Other features, such as hedgehog highways could be considered.					
Opportunities for enhancement	Enhancing the river corridor and HPI habitats should be a priority for enhancement as it will increase the habitats' resilience to anthropomorphic changes. Bramble scrub enhanced to species-rich mixed scrub of good condition. Planting additional rural trees, hedgerows and scrub would provide ecological benefits, in addition to delivery of other ecosystem services (e.g. urban cooling, water retention etc). Creation of scrapes and ponds would provide permanently and temporary wet habitats which would benefit a range of wildlife.					

Baseline habitat map

Table 11: Site F: Land at Upton Farm Site Allocations Assessment

Site Name	Site F: Land at Upton Farm					
Sie Area (ha)	0.9337					
Habitats present at baseline	Modified grassland Bramble scrub Developed land; sealed surface Rural trees Species-rich native hedgerow					
Baseline Units	**Habitats**		**Hedgerow**		**Water course**	
	5.01		0.62		0.00	
BNG modelling results	***Model 1***		***Model 2***		***Model 3***	
Post development habitat units	1.48		1.30		2.27	
% BNG in habitat units	-70.43%		-74.03%		-54.77%	
Target BNG	***10%***	***20%***	***10%***	***20%***	***10%***	***20%***
Unit shortfall	8.06	9.06	8.42	9.42	6.49	7.49
Approximate cost of meeting BNG	£231,786	£260,603	£242,142	£270,959	£186,649	£215,465

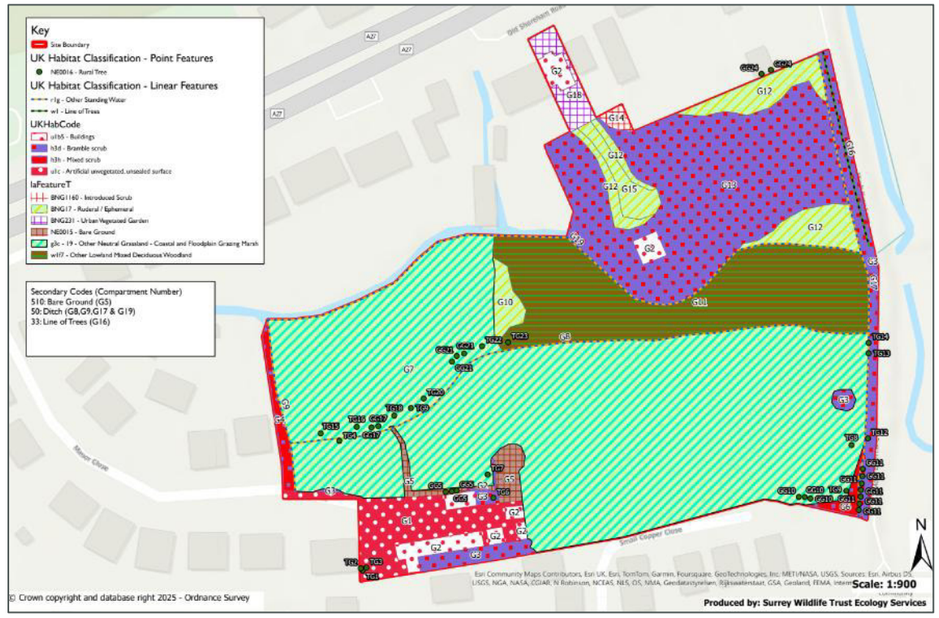
Baseline habitat map

Site Overview	Site F is the fourth smallest of the eight potential site allocations. It does not fall within in any statutory or non-statutory designations, or BOA. A HPI habitat, hedgerow, is present within this site. The connectivity analysis indicates that this site provides notable connectivity, with a key connectivity corridor from west to east Adur present in the north of the site. It should be noted that towards the northern boundary of the study area boundary (where the A27 is present) there is already a higher resistance to species movement, relative to the southern boundary adjacent to the coast, and movement along the River Adur north to south; this corridor links to the core nature area just outside the north-western corner of the study area, and therefore allows dispersal between the study area into the wider landscape. Further to this, there is a key habitat corridor immediately adjacent to the site's western boundary, which links the core nature area just outside the north-western corner of the study area to the south-west near to Sompton Brooks (potential LWS) and Cokeham Brooks LWS, where there is currently high resistance to species movement as presented on Figures 6 and 7.
Fauna suitability	Amphibians (in their terrestrial phase); badger; bats (foraging, commuting and roosting bats); birds (farmland, nesting, barn owl); dormouse; hedgehog; invertebrates; reptiles; and other mammals (such as rabbit and fox).
Impacts that could be avoided	Where possible, avoid the loss of semi-natural habitat, including rural trees, scrub and hedgerow.
Impacts that could be mitigated or compensated for	Should protected species, and species of conservation concern be present, if developed the site would not be able to support a viable population of ground-dwelling species (e.g. reptiles, hedgehogs), given the presence of developed land. As such, a bespoke mitigation strategy will need to be developed, which could include translocation as a last resort. Inclusion of integrated bird (specifically swift) and bat boxes will benefit biodiversity, in addition to a lighting strategy that maintains a dark corridor. Other features, such as hedgehog highways could be considered.
Opportunities for enhancement	Bramble scrub enhanced to mixed scrub of good condition, and enhancement of modified grassland to other neutral grassland from moderate to good condition, enhancement of hedgerow from poor to good condition. Planting additional urban trees, scrub and hedgerows would provide ecological benefits, in addition to delivery of other ecosystem services (e.g. urban cooling, water retention, connectivity etc).

Table 12: Site G: Land East of Manor Close Site Allocations Assessment

Site Name	Site G: Land East of Manor Close					
Sie Area (ha)	2.8791					
Habitats present at baseline	Introduced shrub Ruderal/Ephemeral Vegetated garden Coastal and floodplain grazing marsh HPI Bramble scrub Mixed scrub			Bare ground Developed land; sealed surface Artificial unvegetated, unsealed surface Lowland mixed deciduous woodland HPI Rural trees Line of trees Ditch		
Baseline Units	**Habitats**		**Hedgerow**		**Water course**	
	34.29		0.32		6.08	
BNG modelling results	***Model 1***		***Model 2***		***Model 3***	
Post development habitat units	6.99		6.44		9.41	
% BNG in habitat units	-79.61%		-81.23%		-72.56%	
Target BNG	***10%***	***20%***	***10%***	***20%***	***10%***	***20%***
Unit shortfall	61.46	68.32	62.57	69.43	56.62	63.48
Approximate cost of meeting BNG	£5,436,912	£6,043,626	£5,535,219	£6,141,932	£5,009,026	£5,615,739

Baseline habitat map



Site Overview	Site G is the third largest of the eight potential site allocations. It does not fall within in any statutory or non-statutory designations, or BOA. However HPI habitats are present including lowland mixed deciduous woodland and CFGM. Ecologically valuable habitats including lines of trees, rural trees and ditches are also present. The connectivity analysis indicates the site provides notable connectivity, with a key ecological corridor passing through the site. This corridor connects to a core nature area immediately to the north of the study area boundary, and beyond this core nature area there is high resistance to dispersal (see Figures 6 and 7). Further, as presented on Figure 7, it provides a key corridor for dispersal from the core nature area to the wider area of study area; evidenced by the multiple routes it divides into to the south-east, south and south-west. As above, it is also near the A27 where there is a relatively higher resistance of dispersal. There has been significant development around this since 2019 with a residential development constructed to the south and southeast, and further development likely to take place to the East. This has fragmented the habitats present on site, which makes conserving and enhancing the connectivity corridor an imperative. It should be noted that this site falls within Flood zones 2 and 3 (GOV.UK, Accessed 13/03/2025)
Fauna suitability	Amphibians (breeding and in their terrestrial phase); badger; bats (foraging, commuting and roosting bats); birds (wintering, farmland, woodland, nesting, barn owl); dormouse; hedgehog; invertebrates; otter; reptiles; water vole and other mammals (such as harvest mouse, rabbit and fox).
Impacts that could be avoided	Impacts to confirmed HPI habitats, hedgerow and ditches should be avoided to further minimise the existing habitat fragmentation in the wider area. The site has habitats that could support a range of protected/notable species and further surveys should be completed to determine if these species are present/likely absent. Where possible, avoid the loss of semi-natural habitat, including rural trees, scrub and grassland.
Impacts that could be mitigated or compensated for	Further protected species surveys are required to determine which species/species groups are present and what requirements for mitigation/compensation would be required to facilitate development. Inclusion of bird (specifically swift and barn owl) and bat boxes will benefit biodiversity, in addition to a lighting strategy that maintains a dark corridor. Other features, such as hedgehog highways could be considered.
Opportunities for enhancement	Enhancement of retained HPI habitat is critical to increasing its resilience to anthropomorphic changes. Other retained habitats can be enhanced to better condition, and diversification of species mixes (e.g. bramble scrub managed to mixed scrub). Planting additional rural trees, hedgerows and mixed scrub would provide ecological benefits, in addition to delivery of other ecosystem services (e.g. urban cooling, water retention etc).

Table 13: Site H: Land at Mill Hill Site Allocations Assessment

Site Name	Site H: Land at Mill Hill					
Sie Area (ha)	5.7883					
Habitats present at baseline	Modified grassland Other neutral grassland Bramble scrub Ruderal/Ephemeral Tall forbs Artificial unvegetated, unsealed surface Bare ground Developed land; sealed surface Rural trees					
Baseline Units	**Habitats**		**Hedgerow**		**Water course**	
	28.12		0.00		0.00	
BNG modelling results	***Model 1***		***Model 2***		***Model 3***	
Post development habitat units	6.66		5.54		11.52	
% BNG in habitat units	-76.32%		-80.29%		-59.02%	
Target BNG	***10%***	***20%***	***10%***	***20%***	***10%***	***20%***
Unit shortfall	48.54	54.16	50.77	56.40	38.81	44.43
Approximate cost of meeting BNG	£1,341,834	£1,497,291	£1,403,600	£1,559,057	£1,072,899	£1,228,355
Site Overview	Site H is the second largest of the eight potential site allocations. It does not fall within in any statutory or non-statutory designations, or BOA. No HPIs are present within this site however lowland mixed deciduous woodland HPI is present along its western boundary, and adjacent to the north-eastern corner. It is also adjacent to the southern and western boundaries of the Mill Hill BOA and LWS, which then link to Mill Hill LNR. Lastly, there the only NRV in the study area connecting to the north-eastern corner of the site and that runs along the A27 The connectivity analysis indicates that this site does not provide notable connectivity, however due to the immediately adjacent ecologically valuable areas, there is a key connectivity linkage adjacent to the western and northern boundaries of the site; this pathway allows dispersal from study area to wider landscape situated within the South Downs National Park and core nature area within Mill Hill LWS/LNS (see Figures 6 and 7). In addition, due to its location near the A27 in the north, also is of value for dispersal east to west through the study area.					
Fauna suitability	Amphibians (breeding and in their terrestrial phase); badger; bats (foraging, commuting and roosting bats); birds (wintering, farmland, woodland, nesting, barn owl); hedgehog; invertebrates; otter; reptiles; water vole and other mammals (such as harvest mouse, rabbit and fox).					
Impacts that could be avoided	Where possible, development should seek to retain and higher distinctiveness habitats such as other neutral grassland and rural trees. An important connectivity pathway is present in the woodland to the west of the site, and adjacent to the northern boundary of the site (adjacent to the A27) therefore impacts to habitat along the western boundary should be avoided.					
Impacts that could be mitigated or compensated for	Should the site be allocated, sensitive development design and construction methods would be required to mitigate impacts. Further surveys to determine presence or likely absence of protected species would be required, and appropriate mitigation developer based on the results. Inclusion of integrated bird (specifically swift) and bat boxes will benefit biodiversity, in addition to a lighting strategy that maintains a dark corridor particularly along the woodland boundary to the west. Other features, such as hedgehog highways could be considered.					
Opportunities for enhancement	Considering the site is adjacent to a connectivity corridor, strengthening the western and northern boundary through habitat enhancement should be a priority. This could be achieved by establishing woodland buffer with ecotones, including grassland and scrub. To further enhance connectivity, species-rich hedgerow across the rest of the site could be considered. Improving and diversifying retained grassland habitat and creating waterbodies (ponds/scrapes) will further enhance the habitats. Planting additional urban trees, native hedgerows and mixed scrub would provide ecological benefits, in addition to delivery of other ecosystem services (e.g. urban cooling, water retention etc).					

Baseline habitat map

Figure extracted from BNG Feasibility Assessment Summary Report (Bakerwell, 2024)

6 Connectivity analysis

6.1.1 The scope of work included an analysis of connectivity across the study area to identify priorities for delivering biodiversity net gain offsets. Adopting a strategic approach to delivery of nature restoration and creation maximises the biodiversity outcomes. This is achieved by establishing a thorough understanding of the current ecological components and the interrelationship between these to identify opportunities to prioritise resource allocation in a connected landscape. By mapping and identifying key habitats and wildlife corridors, the Lawton principles of "bigger, better and more joined up" (Lawton, 2010) are achieved. To deliver this objective, the study comprised a review of baseline information (protected sites, habitats and species) and assigning resistance values to habitat layers and open space layers to represent barriers to the movement of species across the landscape. Using a specialised mapping tool (Circuitescape®) that analyses the opportunities for movement across the landscape, it was possible to identify the least-cost pathways, where barriers across the landscape are lowest and movement opportunities for species are highest. From this, connectivity corridors were then identified; these have been detailed in Section 5 above, and also presented on Figures 6 and 7. The methodology is presented in Appendix 5.

6.1.2 Nature provides several ecosystem benefits, from regulatory services (processes to maintain beneficial environmental conditions such as maintaining water and air quality), provisioning services (such as food, fuel, material provision) and cultural, including health and tourism. It is recommended that any nature restoration across Adur is prioritised within the connectivity corridor, as presented in Figure 6 and 7. Creating stepping stones between these through enhancing open spaces, playing field boundaries will further enhance opportunities for biodiversity across Adur. This approach will benefit the residents of Adur in the short, medium and long-term.

7 Policy recommendations

7.1.1 Adur's Adopted Local Plan (Adur District Council, 2017) includes the following visions relating to biodiversity:

- Vision 7: Adur's character and local distinctiveness (urban and rural, coastal and countryside) will have been maintained and enhanced through protection and enhancement of its landscape, townscape, cultural heritage and biodiversity. Important views will have been protected. Net gains in natural capital will have been delivered. Much of Adur's coastline will continue to be used for leisure and recreation, and public access to the river, harbour, countryside and coast will have been improved. Opportunities will be taken to capitalise on Adur's location adjacent to the South Downs National Park.
    - Objective 6: Adding to natural capital by improving biodiversity, recreation and leisure facilities in order to provide an interlinked network of multifunctional open spaces (within the context of a Green Infrastructure Strategy) - through and from urban areas (including Shoreham Harbour) to the coast and countryside, the provision of open space and greater opportunities for (and access to) informal recreational uses within the countryside and Local Green

Gaps. Public access to the National Park and other countryside assets will be improved

- Objective 7: To protect and improve the setting of the South Downs National Park, the character and setting of the River Adur, the coastal waterfront, countryside and the Local Green Gaps, conservation areas and other cultural and historic assets and where appropriate, access to them. Areas of nature conservation value will be preserved and enhanced. New development will avoid impacts on biodiversity and the natural environment as far as possible and mitigate and/or compensate where necessary.

7.1.2 The adopted local plan includes the following policies relating to biodiversity and the study area:

- Policy 13: Adur's Countryside and Coast, this requires applications for a change of use or conversion of existing buildings to ensure there is no adverse impact on biodiversity that cannot be mitigated to an acceptable level.
- Policy 15: Quality of the built environment and public realm requires a respect of the natural features of a site, including biodiversity and contribute positively to biodiversity.
- Policy 30: Green Infrastructure requires the protection and enhancement of green infrastructure and consideration of ecological characteristics to maximise biodiversity benefits. The planting of trees will be supported and encouraged.
- Policy 31: Biodiversity, requires:
  - Protection, conservation and where possible enhancement of biodiversity including nationally and locally designated sites, BOAs, and habitats, including wildlife corridors and protected and priority species.
  - Where harm cannot be avoided, this needs to be mitigated, where it cannot be mitigated compensated for. Where no suitable compensation exists, permission should be refused.
  - Development affecting a SSSI should be refused, unless the benefits outweigh the impacts on the designated site.
  - Development affecting a locally designated site will not be permitted unless the reasons for the proposal outweigh the need to safeguard the nature conservation value.
- Policy 36: Flood risk and sustainable drainage requires sustainable urban drainage to seek to enhance landscapes, biodiversity gains and provide quality spaces.

7.1.3 Building on the objectives of the adopted Local Plan, we advise the following objectives are incorporated into the new Local Plan:

- Protect, restore and enhance the connectivity network identified through this study.
- Maximise tree protection and encourage planting the right tree in the right location.
- Deliver an ambitious biodiversity net gain target.
- Incorporate measures to enhance biodiversity opportunities across all developments.
- Provide benefits to the community through inclusive designs for all users, irrespective of social group or abilities and promote health and well-being across Adur.

- Work with partners to build and secure funding, effective governance and stewardship for new and existing green and blue infrastructure to ensure their long-term sustainability.

7.1.4 Further information on how the above will be achieved is detailed below.

Protect, restore and enhance the connectivity network identified through this study.

7.1.5 Adur Council will:

- Review the information detailed in this report in light of the potential site allocations
- Undertake the recommended field surveys for the potential LWSs (as detailed in appendix 2).
- Determine whether to put the proposed LWS forward based on the outcome of the assessments. Where new LWS' are identified, these will strengthen the resilience of the connectivity corridor. Opportunities for enhancement will be further explored.
- Discuss with applicants the appropriate location for delivery of any offsite compensation, such that this enhances the connectivity corridor, improves habitat resilience, and meets local biodiversity objectives. This will be particularly pertinent where the connectivity corridor intersects with the potential site allocations.

Maximise tree protection and encourage planting the right tree in the right location.

7.1.6 Adur Council will:

- Encourage the retention of trees.
    - Require the replacement of trees that cannot be retained for arboricultural reasons at a ratio of 3:1 for small trees, and 13:1 for large trees.
- Require offsite compensation for tree replacement to be delivered within the connectivity corridor, where possible increasing local habitat resilience. To achieve this, Adur Council should identify opportunities for tree planting to ensure a strategic approach is adopted in delivery.
- Identify a list of priority species to guide the tree planting strategy. This could be done in collaboration with the Adur Tree team, and local community groups already involved in active tree planting.

7.1.7 A mature tree supports a wide range of organisms within its structure, from symbiotic fungi at its roots through to bat roosts and bird nests within its trunk, as well as supporting solitary wasps and leaf-mining flies within its leaves. Each native tree species has evolved alongside numerous specialist organisms specific to that tree, as well as being hugely important for generalist species.

7.1.8 As well as being biodiversity hubs, trees are an excellent means of sequestering carbon, due to their growth patterns and photosynthesis, which is important when considering the necessity of reversing the effects of climate change. In urban environments, certain species of trees can filter out air pollutants which can improve air quality, potentially relieving some of the strain on healthcare systems by reducing the instances of respiratory conditions relating to air pollution, such as elder, silver birch and yew (Wang, Maher, Ahmed, & Davison, 2019).

7.1.9 As most native hardwood tree species tend to be slow growing, the felling of a mature tree results in the loss of an ecosystem that cannot be instantly replaced, and the release of a large quantity of stored carbon. In the natural cycle, tree death is compensated for by a cycle of regeneration over the years, with surrounding trees all being at different stages of their life cycle. Felling to facilitate development does not mimic this natural process very well, particularly when the trees being felled are isolated outside of a woodland habitat.

7.1.10 The local plan policies should aim to retain trees wherever possible and where these require removal for arboricultural reasons, an appropriate replacement ratio will be required, if biodiversity net gain principles do not apply to the circumstance. This approach would also contribute to a national need to increase the rate of tree planting to 50,000 ha per year as part of efforts to halt climate change (Committee on Climate Change, 2019).

Encourage planting the right tree in the right location

7.1.11 Trees form an important asset across the landscape and, given the long period of time it takes for this asset to be realised, and to mitigate risk of tree loss, small trees lost should be compensated for at a ratio of 3:1 to account for mortality and life-span, and large trees compensated for at a ratio of 13:1 (Nowak & Aevermann, 2019).

7.1.12 Forest Research conducted an extensive study on the ecosystem services provided by large (Hand & Doick, Ecosystem services delivery by large stature urban trees, 2019) and small and medium stature trees (Hand & Doick, Ecosystem services delivery by small and medium stature trees, 2019b). The recommendations below are made based on the results of these assessments.

7.1.13 In the first instance, any new tree planting should consider the localised ecology to determine whether it is appropriate to plant trees in this location. Guidance on selecting species for is available and should be followed to ensure the species is appropriate to the conditions. Factors to consider are the species (including existing constraints, ecophysiology, delivery of ecosystem services and aesthetics), rooting environment, plant quality and arboricultural practice (Hirons & Sjoman, 2018)

7.1.14 Tree planting should be considered in areas with high sediment run off and/or poor biodiversity. Tree lines along riverbanks assist in the interception of soil runoff from agricultural land and secure riverbanks via their root systems, preventing bank collapse. Additionally tree roots, dead wood and leaf litter provides nursery habitats for numerous fish and invertebrate species, adding structure to the river ecosystem and improving biodiversity.

7.1.15 Consideration should be made in selecting planting location to ensure the presence of trees will not disrupt access to buried services including:

- Gas mains
- Water works
- Electricity lines
- Oil pipelines

7.1.16 Where services are identified, tree planting will be relocated to a more appropriate location.

7.1.17 Where new tree planting opportunities have been identified the following should be considered:

- The species selected should be of local provenance and a native species, or species that is known to provide biodiversity benefits.
- Species that should be considered for planting include:
    - Standing mature trees:
        - Pedunculate oak
        - Beech
        - Sycamore
        - Holm oak
        - Lime species
        - Sweet cherry
        - Rowan
        - Bird cherry
        - Silver birch
    - Hedgerow
        - Yew
        - Hornbeam
        - Field maple
        - Rowan
        - Holly
        - Bird cherry
        - Hawthorn
        - Hazel
        - Elder
        - Blackthorn

7.1.18 Species should be strategically diverse to enhance resilience of tree populations for future biotic and abiotic threats. Larger species that have the greatest benefit across a range of ecosystem services should be selected (Hirons & Sjoman, 2018).

7.1.19 Where hedgerows are planted there should be a minimum of five species per 30m, such that these can be native species-rich hedgerows, enhancing the local biodiversity.

7.1.20 Tree management should be undertaken by qualified arborists. It is advised that grassland under the tree drip line is not mown to promote biodiversity. Biodegradable tree guards should be used when planting to minimise plastic waste, although consideration could be made to not using tree guards.

7.1.21 Hedgerows should be managed on a five-year rotation whereby 20% of the hedgerows are cut in any one year. Where possible a minimum of 1m either side of the hedgerows should be left unmown to promote biodiversity

Deliver an ambitious biodiversity net gain target.

7.1.22 Development must deliver a 10% biodiversity net under the Environment Act 2021. Considering the biodiversity and climate change crises, Adur should consider requiring development to deliver an ambitious minimum 20% biodiversity net gain.

National context

7.1.23 Embedding policies that benefit nature is critical to the success of businesses at a national, regional and local level. The Green Finance Institute estimates that nature and climate change impacts could result in a loss of 12% of the UK's GDP (Green Finance Institute, 2024). Furthermore, more than half the businesses on the London Stock Exchange are moderately or highly dependent on nature (Price Waterhouse Cooper, 2024).

7.1.24 In addition to the robust link between nature and a resilient economy the OECD 2019 report that indicates:

- The annual value of the natural environment's benefits to physical and mental health as £2 billion in the UK (OECD, 2019). This is through alleviating the pressure on the NHS, as increased access to the natural world improves physical fitness which reduces likelihood of injury and low-fitness related illnesses such as heart disease. It also reduces the amount of resources the NHS needs to spend on stress-related illnesses and can aid in management of chronic mental health conditions. A secondary benefit to this is that the number of people out of work for health-related reasons is reduced, resulting in more people in the workforce (contributing to the economy).
- A biodiverse population of pollinators can relieve pressures on the farming industry, as more pollinators with varying specialities mean that less time and resources are spent artificially pollinating crops. A diverse population of natural enemies to plant pests (e.g. parasitic wasps specific to different species of scale insect) reduce the effect of pest damage to crops, meaning less money is spent supplying chemical pesticides, and more profit can be made from a higher yield.
- In the UK, agriculture and fisheries are reliant on biodiversity for their long-term survival.
- Protecting and enhancing existing wetlands, and creating new wetlands, can have a beneficial effect on the water supply chain in addition to supporting biodiversity gain.

7.1.25 Considering the above, ensuring the balance between biodiversity gains and development is essential to deliver the UK's government to build and strengthen the economy.

7.1.26 A 10% gain in biodiversity was mandated in England through the Environment Act 2021. With the aim of determining the BNG policy approach, the scope of work included an assessment of the current and emerging biodiversity net gain policies around the UK and an assessment of whether there was a justification for Adur to develop a planning policy requiring development deliver a higher BNG requirement than the mandated 10%.

7.1.27 At a national level, multiple local authorities and neighbourhood groups are reviewing their local, and neighbourhood plans, reflecting changes in the NPPF. In line with this

and simultaneous to councils declaring climate change and biodiversity emergencies, several LPAs have adopted a policy requiring a percentage BNG higher than 10%, and more LPAs have policies emerging through their local plan review (Planning Advisory Service, 2025). Table 15 below presents some examples of these.

7.1.28 In setting the appropriate target, the key elements are balancing developmental needs and housing targets with resilience to climate change and biodiversity loss, along with costs to developers and ultimately households.

7.1.29 BNG is underpinned by the mitigation hierarchy: which comprises, impact avoidance mitigation where these cannot be avoided, restoration of retained habitats and as a last resort, compensation when other options have been exhausted. When reviewing these net gain targets it is critical to keep this hierarchy in mind, as the key aim is to retain and enhance the best habitats throughout project life-cycles and compensate for these as a last resort. This is reflected in Adur's Adopted Plan policy 31.

7.1.30 In 2018, DEFRA produced an impact assessment on biodiversity net gain, which contained a cost/benefit analysis discussing how biodiversity decline can be reversed while still being achievable from an economic perspective.

7.1.31 DEFRA indicates in its cost benefit analysis that 10% is the **lowest level** of net gain that is required to deliver a genuine net gain or a no net loss; whilst the Natural Capital Committee *"indicates that a net gain of 10% or above is necessary to give reasonable confidence in halting biodiversity loss* (Natural Capital Committee, 2019)*."* However, the same report also states that *"the analysis undertaken … indicates that the level of requirement makes relatively little difference to the costs of mitigating and compensating for impacts."*

7.1.32 This is supported by multiple viability assessments that have been undertaken in the south-east, including:

- Kent County Council that explored the impact of delivering a 10, 15 and 20% biodiversity net gain on development (SQW and Temple Group, 2022)
- Essex County Council (SQW and Temple Group, 2024)
- Elmbridge Borough Council (Dixon Searle Partnership, 2023)
- Swale Borough Council (personal communication, 2024)

7.1.33 In all cases, whilst an increase in cost was associated with delivering a higher than 10% mandated biodiversity net gain, this did not result in a material impact on the viability of the development.

Regionally

7.1.34 The Sussex Local Nature Partnership has not published specific guidance on the appropriateness of the mandated biodiversity net gain. In neighbouring Surrey, the Surrey Nature Partnership (SNP) is a strong advocate of delivering a 20% biodiversity net gain (Surrey Nature Partnership, 2020) due to the continued threat to biodiversity at a local level, review of the evidence from the national cost/benefit analysis (DEFRA, 2019) and natural capital approach (Surrey Nature Partnership, 2015). Setting an ambitious and pragmatic target is critical to halt, and where possible reverse,

biodiversity declines. This is also critical for local businesses considering a large proportion of these require a functioning ecosystem to prosper.

8 Modelling and costs for delivering BNG

8.1.1 Adur District is home to a variety of habitats, divided by the River Adur running east to west and the A27 running north to south. The north of the district is characterized by grasslands, woodlands, and a mix of arable and pastoral land, with much of this area being part of the South Downs National Park.

8.1.2 The southern part of the district is more developed, with residential areas being the dominant feature. In addition, there are roads and rail; commercial development; and green open spaces including amenity grasslands; Brighton City Airport; some agricultural land and pastoral fields; and riparian networks and wetland areas. Although some connectivity exists, the habitats in this area are often isolated and lack open spaces, making them vulnerable to the effects of development and climate change.

8.1.3 Adur supports a variety of protected areas including SSSIs, LNR, ancient woodland, BOAs, LGS, LWS and NRV. Three of the eight site allocations tested for biodiversity opportunities are located within a BOA. Additionally, a number of sites and areas across the district are HPI. Due to the various habitats of interest, setting a 20% target will ensure the best of the remaining habitats will be retained and enhanced, thus increasing the resilience of the ecosystems across the borough, deliver more ecosystem services and contribute towards the Council's climate change strategy ambitions.

8.1.4 In determining the approach to setting a biodiversity net gain target, a review of the potential site allocations was undertaken across eight potential site allocations. This included assessing the habitats present and their condition based on a field survey undertaken in February 2025, noting a precautionary approach was adopted to account for the seasonality of the survey work.

8.1.5 The information collected was used to model three development scenarios:

- Model 1:
  - Based on (DEFRA, 2024a)
  - Development ratio 70:30 comprising 25% vegetated garden, 2.5% mixed scrub of moderate condition and 2.5% other neutral grassland of moderate condition
- Model 2:
  - Development ratio 80:20, comprising 15% vegetated garden, 2.5% mixed scrub of moderate condition and 2.5% other neutral grassland of moderate condition
- Model 3:
  - Development ratio 60:20, comprising 25% vegetated garden, 2.5% mixed scrub of moderate condition and 2.5% other neutral grassland of moderate condition

8.1.6 For each model, the number of units required to deliver a 10% and a 20% biodiversity net gain was determined, and the unit shortfall was identified. The cost of purchasing the units offsite was assessed using the latest information on unit prices in England

(Biodiversity Units UK and Arbtec, 2024), along with SWT Ecology Services' professional judgement. This information is presented in the table below.

Table 14: Modelling Costs

SWT Site Ref	Site Allocations	Model 1		Model 2		Model 3		Average cost	
		10%	20%	10%	20%	10%	20%	Deliver 10%	Deliver 20%
A	Car Park, Beach Green	£153,880	£178,377	£160,567	£184,825	£117,816	£142,313	£144,087.89	£168,505
B	Land East of Adur Close	£69,003	£89,154	£71,468	£91,619	£58,270	£78,421	£66,247.24	£86,398
C	Lancing Meadows	£25,224,693	£27,672,563	£25,588,573	£28,036,443	£23,640,328	£26,088,198	£24,817,864.37	£27,265,735
D	Land North of Hill Farm Way	£43,116	£48,479	£45,841	£51,205	£31,201	£36,565	£40,052.53	£45,416
E	Shoreham Gateway	£7,971,070	£8,751,247	£8,087,922	£8,868,099	£7,550,316	£8,242,260	£7,869,769.59	£8,620,536
F	Land at Upton Farm	£231,786	£260,603	£242,142	£270,959	£186,649	£215,465	£220,192.26	£249,009
G	Land East of Manor Close	£5,436,912	£6,043,626	£5,535,219	£6,141,932	£5,009,026	£5,615,739	£5,327,052.38	£5,933,766
H	Land at Mill Hill	£1,341,834	£1,497,291	£1,403,600	£1,559,057	£1,072,899	£1,228,355	£1,272,777.45	£1,428,234

Capacity to deliver a 20% gain with the connectivity corridor

8.1.7 Opportunities to deliver offsite gains exist across Adur. This could be achieved by:

- Prioritising enhancing HPI habitats, due to their higher distinctiveness this will provide additional benefits to biodiversity and ensure high value and biodiverse habitats are delivered across Adur.
- Enhancing habitats within LWS' and particularly bringing new LWS' into positive management. Having resilient habitats within Adur will help buffer anthropomorphic changes associated with climate change and mitigate the biodiversity crisis.
- Create stepping stones in open spaces, through changing management measures in parks, for example, leaving drip lines under trees unmown, and allocating areas of low management to promote natural regeneration.
- Improving habitats of moderate and poor condition.
- Prioritise habitat improvements within the connectivity corridor.

8.1.8 With these measures in place, it will be possible to deliver offsite offset requirements within Adur, improve habitat resilience and benefit local communities.

Conclusion

8.1.9 Given the severity of the climate change and biodiversity crisis, limited financial impact of delivering 20% versus 10% biodiversity net gain, it is highly advised the Council requests developments deliver a 20% biodiversity net gain and offsite offsets are prioritised within the connectivity corridor.

Table 15: Case studies for delivery of biodiversity net gain targets

Authority	Relevant policy	Minimum net gain threshold	Supported by
Bath and East Somerset Council	Policy NE3A	Required 10% BNG to be delivered for all major developments. For minor development, development will only be permitted where there is no set loss and appropriate gains is secured via the small sites metric. Opportunities to secure BNG on householder and brownfield sites will be explored. Further research for the new local plan regarding applicability of higher gains will be explored.	No evidence provided.
Canterbury District Council	Proposed Canterbury District Council Local Plan (DS21)	Proposals for 20% minimum threshold, in consultation.	No evidence provided within proposed local plan.
Cherwell District Council	Proposed Cherwell District Council Local Plan	Development will be required to demonstrate a minimum of 10% net gain. At least 20% biodiversity net gain will be sought in the Nature recovery Network Core and recovery zones, and new urban extensions will be required to achieve 20% biodiversity net gain.	No evidence provided within proposed local plan.

Authority	Relevant policy	Minimum net gain threshold	Supported by
East Devon District Council	Proposed East Devon Local Plan	Proposed local plan states: Major development proposals will need to deliver biodiversity net gain (BNG) of at least 20% to be calculated using the most up-to-date statutory metric. Where there is a demonstrable viability problem to achieve this target, it will be expected that all measures to exceed the national minimum requirements are made, and evidence for not achieving the 20% target is provided in full. Non-major developments will be required to secure at least 10% BNG.	The Environment Act 2021. Nature Recovery Declaration for East Devon.
Elmbridge Borough Council	Proposed Elmbridge Local Plan	A proposed change set out within the modifications is increasing the BNG requirement of draft Policy ENV6 from 10% to 20%.	Surrey Nature Partnership 20% BNG Position Statement. DEFRA Biodiversity Net Gain Impact Assessment. The Council's Viability Assessment of the Draft Elmbridge Local Plan.
Greater Cambridge Shared Planning	Proposed Cambridge Local Plan	Proposals for 20% minimum threshold, in consultation.	Biodiversity SPD (Consultation Draft). Doubling Nature Strategy. Biodiversity and Green Spaces Topic Paper.
Guildford Borough Council	Adopted Development management policies	20% minimum within the adopted local plan.	Surrey Nature Partnership's recommendation for 20% BNG. Tested through the Viability Assessment. Additional case study evidence provided under Matter 3 Policy P6/P7.

Authority	Relevant policy	Minimum net gain threshold	Supported by
The Royal Borough of Kingston Upon Thames	Proposed Kingston Upon Thames Local Plan	Proposed plan states: Developments will be required to deliver a minimum of 30% Biodiversity Net Gain.	Good Practice Guide - Biodiversity & the Development Process in Kingston upon Thames. Nature Conservation in Kingston upon Thames - Ecology Handbook 18.
Maidstone Borough Council	Adopted Maidstone Borough Council Local Plan	20% minimum BNG within the adopted local plan.	The Kent Environment Strategy (2016) The Kent Biodiversity Strategy (2020-2045)
Mid Sussex District Council	Adopted Mid Sussex District Council Local Plan	10% BNG required although the Council will encourage a higher level of biodiversity net gain. 20% BNG will be required for Significant Sites and for the Significant Sites allocations in this Plan DPSC1 – DPSC3.	No evidence provided within adopted local plan.
Mole Valley District Council	Adopted Mole Valley District Council Local Plan	20% minimum BNG within the adopted local plan.	Surrey Nature Partnership's recommendation for 20% BNG.
Richmond Borough Council	Proposed Richmond Borough Council Local Plan	Proposals for 20% minimum threshold, in consultation.	No evidence provided within proposed local plan.
Sevenoaks District Council	Proposed Sevenoaks District Council Local Plan	Proposals for 20% minimum threshold, in consultation.	Kent Nature Partnership promotion of a county-wide target of 20% BNG. Kent County Council strategic viability assessment of BNG in Kent.

Authority	Relevant policy	Minimum net gain threshold	Supported by
Surrey Heath Council	Proposed Surrey Heath Council Local Plan	Proposals for 20% minimum threshold, in consultation.	Recommendations for 20 percent Biodiversity Net Gain in Surrey 2020 by SNP 2019. Windlemere Biodiversity Net Gain site proposal - Brochure 2024. Hart, Rushmoor and Surrey Heath Water Cycle Study May 2017.
Swale Borough Council	Proposed Swale Borough Local Plan Policy DM28 – Biodiversity and geological conservation	Proposals for 20% minimum threshold, in consultation.	Local Plan Viability Study. Swale Biodiversity Baseline Report in Preparation for Requirements of the Environment Bill.
Tower Hamlets Council	Proposed Tower Hamlets Draft Local Plan	Proposed plan states: The BNG benchmark is a minimum 2.5 biodiversity unit (BU) per hectare or 30% gain (whichever is higher) in habitat value for wildlife compared with the pre-development baseline.	Tower Hamlets Local Biodiversity Action Plan, 2019 All London Green Grid Supplementary Planning Guidance, 2012 Review of Sites of Importance for Nature Conservation in Tower Hamlets, 2023 Tower Hamlets Biodiversity Net Gain Feasibility Study, 2023
Wiltshire Council	Proposed Wiltshire Council Local plan	Proposals for 20% minimum threshold, in consultation.	Where and if required Wiltshire Council's approach to biodiversity net gain may be supported by a supplementary planning document and/or a further implementation note/guidance following the Local Plan adoption, as necessary.

Incorporate measures to enhance biodiversity opportunities across all developments

8.1.10 The Council will require development incorporate:

- Installation of integrated bird and bat boxes (e.g. in line with the new British Standard BS 42021:2021 Integral nest boxes – Selection and installation for new developments (in publication). This provides specifications and appropriate numbers of boxes, commensurate with the size of development.
- Including holes under fences to minimise barriers to species movement.
- Incorporating integrated invertebrate boxes
- Including reptile and amphibian hibernacula in secluded garden areas (where available).

8.1.11 Landscaping plans that specifically include address how the selected species are appropriate for the habitat type, deliver climate change resilience and benefit biodiversity. Secondary benefits such as food production or air purification will be encouraged.

Provide benefits to the community through inclusive designs for all users, irrespective of social group or abilities and promote health and well-being across Adur

8.1.12 The Council will:

- Require developments deliver high quality, multi-functional GBI
- Encourage partnership between departments to identify and deliver suitable opportunities for green social prescribing and prioritise areas within the connectivity corridor

8.1.13 Delivering inclusive designs is key to delivering high quality multi-functional green infrastructure. The Landscape Institute has developed guidance with regards to this which recommends the following (Landscape Institute, 2019):

- Prioritising people and cyclists over vehicles that make up the majority of people's journeys
- Providing seating opportunities for resting (this could be achieved using recycled materials where available)
- Creating more interesting streetscapes to make the journeys more memorable
- Providing a choice of routes whilst minimising unnecessary segregation
- Providing accessible wayfinding and signage
- Taking care with colours and contrasts to avoid confusing people with poor sight to dementia
- Mitigating the effects of topography
- Ensure natural surveillance
- Protecting users from hazards
- Ensure good lighting where appropriate
- Providing well-signed access to drinking water and toilet facilities
- Providing a refuge of calm within busy areas for mental as well as physical, rest and recover.

8.1.14 The benefits of countryside volunteering extend beyond physical improvements to Adur's greenspaces. The considerable health benefits of outdoor exercise, both mental and physical, are widely accepted. Residents contributing to habitat management

within Adur have the opportunity to meet people and socialise whilst learning new skills, discovering new places, and making a positive difference to their local environment. In a recent study published by Public Health England, 10% of medication prescribed to individuals has no or a harmful effect on the individual (Ridge, 2021).

8.1.15 The Council has an opportunity to develop and enhance programmes that deliver social prescription using nature-based interventions and activities such as community gardening, green gyms and food-growing projects. To inform the design of these programmes a working group should be developed in partnership between Council departments including primary and secondary care givers, community support and greenspaces management to identify suitable opportunities for green social prescribing and prioritise areas within the connectivity corridor network where this could be undertaken.

Additional considerations for development of policy

8.1.16 Below are a series of considerations that could inform the Local Plan policies and to guide how the objectives of the strategy could be met.

Landscape connectivity and improved habitat resilience

- All major schemes should demonstrate how the proposed designs delivery connectivity across the development and link to the connectivity network.
- All green infrastructure should be accessible to all users.
- Development should create opportunities to deliver multiple ecosystem services including reduction of urban heating, carbon sequestration and natural flood management.
- Develop a Supplementary Planning Document that includes quality standards for green infrastructure and ecological habitats incorporated into designs.
- Require the inclusion of integrated biodiversity enhancements for all new buildings.
- Require the delivery of a 20% biodiversity net gain, evidenced by the inclusion of the latest DEFRA-recognised Biodiversity Metric version current at the time of submission.
- Maximise opportunities to protect existing and increase tree cover, and introduce or extend new hedgerows, setting it within the context of a plan for biodiversity net gain and having regard for the prevalent tree species and landscape character.
- Have regard for the changing climate and prevalent tree diseases when selecting species which should preferentially be of native provenance and sourced in accordance with the national strategy for biosecurity.

Integrated water management systems

- Include measures to promote sustainability including energy and water efficiency and flood mitigation measures, such as SUDS
- Where flooding downstream is anticipated, align with natural flood management systems such as woodland planting and habitat enhancement. Specifically several of the potential site allocations are within Flood Zone 2 or 3. Identifying nature based solutions to minimise risk will benefit the local ecology, whilst reducing risks to residents.
- Encourage the enhancement and naturalisation of the shoreline, rivers, estuary and waterbodies where opportunities arise.

- Enhance the existing blue infrastructure network, restoring natural processes, where possible.
- Consider the availability of water and water infrastructure over the life-time of the development
- Require all major development proposals and masterplans to demonstrate a landscape-scale approach to water management.
- Ensure surface water is managed at source to improve water quality, reduce flood risk and enhance biodiversity

9 References and bibliography

Adur Council. (2023). *Sompting Brooks flora and fauna survey 1st June.*

Adur District Council. (2017). *Adur Local Plan (Adopted).*

Angold, P. S. (2006). Biodiversity in urban habitat patches. *Science of the Total Environemnt 360 (1-3)*, 196-204.

Baker, R., & Whitfield, L. (2023). *The Current Status of Rare Bats in Surrey V3.* Surrey Bat Group.

Bakerwell. (2024). *Biodiversity Net Gain Feasibility Assessment Summary Report.*

Baldock, K. G. (2019). A systems approach reveals urban pollinator hotspots and conservation opportunities. *Nat Ecol Evol 3*, 363-373.

Bat Conservation Trust. (2020). *Core Sustenance Zones and habitats of importance for designing Biodiversity Net Gain.* London: BCT.

Bat Conservation Trust and Institute of Lighting Professionals. (2023). *Bats and Artificial Lighting at Night: Guidance Note 08/23.* Rugby: BCT and ILP.

Biodiversity Units UK and Arbtec. (2024). *The BNG Report Pricing and Key Insights.*

Bolliger, J. a. (2020). Contribution of connectivity assessments to green infrastructure. *International journal of geo-information 9*, 212.

BRIG (ed. Ant Maddock). (2008). *UK Biodiversity Action Plan; Priority Habitat Descriptions - Intertidal Mudflats.*

Briggs, M. (2001). *The Sussex rare Plant Register or Scarce & Threatened Vascualr Plants, Charophytes, Bryophtes and Lichens.* Sussex Wildlife Trust.

BSBI, UK Center for Ecology and Hydrology, Biological Records Center. (2020). *Plant Atlas*. Retrieved from https://plantatlas2020.org/

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

BSI. (2013). *BS 42020:2013 Biodiversity. Code of practice for planning and development.* London: BSI.

BSI. (2021). *BS 8683 - Process for designing and implementing Biodiversity Net Gain – Specification.* British Standards Institution.

Castel, E. F. (2018, October). Wildlife in London Churchyards: awareness and reality, diversity and distribution. *British Wildlife 30*.

CIEEM. (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine Version 1.3.* Winchester: Chartered Institute of Ecology and Environmental Management.

CIEEM. (2019). *Advice note: On the Life-span of Ecological Reports and Surveys.*

CIEEM. (2021b). *Biodiversity Net Gain Report and Audit Templates.* Winchester, UK: Chartered Institute of Ecology and Environmental Management.

CIEEM. (2022a). *Code of Professional Conduct.* Winchester: CIEEM.

CIEEM. (2024). *Good practice guidance for ecological restoration.* CIEEM.

CIEEM, CIRIA, IEMA. (2019). *Biodiversity net gain. Good practice principles for development. A practical guide.* London, UK: CIRIA C776a.

CIEEM, IEMA, CIRIA. (2024). *Mandatory Biodiversity Net Gain in England: A Guide.* CIEEM.

Collins ed. (2023). *Bat surveys for professional ecologist: good practice guidelines (4th edition).* London: Bat Conservation Trust.

Committee on Climate Change. (2019). *Net Zero. The UK's contribution to stopping global warming.* Committee on Climate Change.

DEFRA. (2006). *Local Sites Guidance on their Identification, Selection and Management.*

DEFRA. (2019). *Biodiversity Net Gain Consultation Impact Assessment.*

DEFRA. (2024a). *Biodiverity Net Gain Metric Statutory Metric: User Guide.* Natural England.

DEFRA. (2024b). *The Statutory Metric - Technical Annex 1: Condition Assessment Sheets and Methodology.* DEFRA.

DEFRA. (2025). *Multi-agency geographic information for the countryside*. Retrieved from https://magic.defra.gov.uk/.

DEFRA. (accessed February 2025). Retrieved from Magic Maps: https://magic.defra.gov.uk/

DEFRA. (n.d.). *Multi-agency geographic information for the countryside*. Retrieved from https://magic.defra.gov.uk/.

Digital Land Solutions Ltd. (accessed February 2025). Retrieved from The Land App: https://go.thelandapp.com/

Dixon Searle Partnership. (2023). *Elmbridge Borough Council Biodiversity Net Gain: Commentary Note Final.*

Fields in Trust. (2018). *Revaluing Parks and Green Spaces. Measuring their economic and wellbeing value to individuals.*

Froglife. (1999). *Reptile survey: an introduction to planning, conduting and interpreation for snake and lizard conservation.* Haselworth: Froglife Advice Sheet 10.

Google Earth. (Accessed 17/02/2025). *Google Earth*. Retrieved from earth.google.com

Google Earth. (Accessed 19/02/2025). *Google Earth* . Retrieved from earth.google.com

GOV.UK. (Accessed 13/03/2025). *Flood risk assessment: flood zones 1, 2, 3 and 3b*. Retrieved from www.gov.uk/guidance/flood-risk-assessment-flood-zones-1-2-3-and-3b

GOV.UK. (Accessed on 04/03/2025). *Statutory biodiversity credit prices*. Retrieved from www.gov.uk/guidance/statutory-biodiversity-credit-prices

Grafius, D. C. (2017). A bird's eye view:using circuit theory to study urban landscape connectivity for birds. *Landscape Ecology 32*, 1771-1787.

Green Finance Institute. (2024). *Assessing the Materialality of Nature-Related Financial Risk in the UK.*

Greenaway, F., & Hill, D. (2004). Woodland management advice for Bechstein's bat and barbastelle bat. *English Nature Research Reports*, Report number 658.

Gurnell, A.M.; England, J.; Shuker, L.C.; Wharton, G. (2019). *The contribution of citizen science volunteers to river monitoring and management: international and national*

perspectives and the example of the MoRPh survey. River Research and Applications, 35: 1359-1373.

Halcrow group Ltd. (2009d). *Reptile Survey Report, Halcrow, West Sussex.*

Hand, K., & Doick, K. a. (2019). *Ecosystem services delivery by large stature urban trees.* Edinburgh: Forest Research i.v. + 1 - 24pp.

Hand, K., & Doick, K. a. (2019b). *Ecosystem services delivery by small and medium stature trees.* Edinburgh: Forest Research i - iv, 1 - 22pp.

Hardy, P.B., & Dennis, R.L.H. (1999). The impact of urban development on butterflies within a city region. *Biodiversity aand Conservation*, 8, 1261–1279.

Harris, S., Cresswell, P., & D, J. (1989). Surveying badgers. *The Mammal Society*.

Hastings Borough Council. (2020). *Climate Emergency Strategy 2020.*

Hastings Borough Council. (2020d). *Hastings Strategic Open and Play Space Assessment.*

Hays, G., Speakman, J., & Webb, P. (1991). Why Do Brown Long-eared Bats (Plecotus auritus) Fly in Winter? *JSTOR*, 65: 554 - 567.

Herpetofauna Groups of Britain and Ireland. (1998). *Evaluating local mitigation/translocation programmes: maintaining best practice and lawful standards.* HGBI: Advisory Notes for Amphibian and Reptile Groups.

Highways England. (2022). *Design Manual for Roads and Bridges.* UK: Department of Transport.

Hirons, D., & Sjoman. (2018). *Tree species selection for green infrastructure.* NERC.

Honeck, E. M. (2020). Implementing Green Infrastructure for the Spatial Planning of peri-urban areas in Geneva, Switzerland. *Sustainability 12*, 1387.

JNCC. (2018). *European Community Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (92/43/EEC); Conservation status assessment for Bechstein's bat.* JNCC.

JNCC. (2024). *UK Biodiversity Action Plan; UK-BAP Priority Habitats.*

Koen, E. B. (2014). Landscape connectivity for wildlife:development and validation of multispecies maps. *Methods in Ecology and Evaluation Vol 5 Issue 7*, 626-633.

Landis. (Accessed 24/02/2025). *Soilscapes*. Retrieved from https://www.landis.org.uk/soilscapes/

Landscape Institute. (2019). *Technical Guidance Note: Inclusive Design.* Landscape Institute.

Lawton, J. (2010). *Making Space for Nature: a review of England's wildlife sites and ecological network.* Report to DEFRA.

Loki, V. a. (2019). Biodiversity potential of burial places - a review on the flora and fauna of cemeteries and churchyards. *Global Ecology and Conservation*, Vol 18.

Marrotte, R. &. (2017). The relationship between least-cost and resistance distance. *PLOS ONE 12(3)*, e0174212.

Mathews, F., LM, K., J, G., CA, H., RA, M., & RF, S. (2018). *A review of the population and conservation status of British mammals: Technical summary.* Natural England,

Peterborough: A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage.

McRae, B. &. (2007). Circuit Theory predicts gene flow in plant and animal populations. *PNAS 104 (50)*, 19885-198890.

McRae, B. D. (2008). Using circuit theory to model connectivity in ecology, evolution and conservation. *Ecology 89(10)*, 2712-2724.

McRae, B., Shirk, A., & Platt, T. (2013). Gnarly Landscape Utilities: Resistance and Habitat Calculator User Guide. *The Nature Conservancy; available at circuitscape.org/gnarly-landscape-utilities*.

McRae, B.H. & Kavanagh, D.M. (2011). *Linkage Mapper Connectivity Analysis Software. Seattle: The Nature Conservancy.* Retrieved from Linkagemapper: https://linkagemapper.org/linkage-mapper-tools/

Miller, H. (2011). *Bechstein's bat survey.* London: Bat Conservation Trust.

Ministry of Housing, Communities and Local Government. (2021). *National Planning Policy Framework.* London: Ministry of Housing, Communities and Local Government.

Ministry of Housing, Communities and Local Government. (2024). *National Planning Policy Framework.* London: Ministry of Housing, Communities and Local Government.

Ministry of Housing, Communities and Local Government. (2024). *Planning Practice Guidance.*

Mitsch, W., Bernal, B., & Hernandez, M. (2016). *Ecosystem services of wetlands.* International Journal of Biodiversity Science, Ecosystem Services and Management.

Morris, P., Bright, P., & Mitchell-Jones, T. (2006). *The Dormouse Conservation Handbook.* Peterborough: English Nature.

National Society for allotment and leisure gardeners. (n.d.). Retrieved from www.nsalg.org.uk.

Natural Capital Committee. (2019). *Advice to government on net environmental gain.*

Natural England. (2009). *Protection of Badgers Act 1992: Guidance note on 'Current Use' in the definition of a badger sett.* Peterborough: Natural England.

Natural England. (2016). *Links between natural environments and physical activity:evidence briefing.*

Natural England. (2021). *Green Infrastructure Tool.* https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Map.aspx.

Natural England. (2022). *Guidance: Ancient woodland, ancient trees and veteran trees: advice for making planning decisions*. Retrieved from https://www.gov.uk/guidance/ancient-woodland-ancient-trees-and-veteran-trees-advice-for-making-planning-decisions

Natural England. (2023b). *Habitat Regulations Assessments: protecting a European site.*

Natural England. (2024). *Green Infrastructure Tool https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Home.aspx.*

Nowak, D., & Aevermann, T. (2019). Tree compensation rates: Compensating for the loss of future tree values. *Urban Forestry and Urban Greening*, 41:93 - 103.

OECD. (2019). *Biodiversity: Finance and the Economic and Business Case for Action, report prepared for the G7 Environment Ministers' Meeting, 5-6 May 2019.* OECD.

Office of National Statistics. (2015). *UK Natural Capital Freshwater Ecosystem Assets and Services Accounts.* ONS.

Office of the Deputy Prime Minister. (2005). *Government circular: biodiversity and geological conservation - statutory obligations and their impact within the planning system.* London: The Stationary Office.

Orly, R. H. (2011). Using multi-scale modelling to predict habitat suitability for species of conservation concern: The grey long-eared bat as a case study. *Biological Conservation*, August.

Palmer, E., Pimley, E., Sutton, G., & Birks, J. (2013). *A study on the population size, foraging range and roosting ecology of Bechstein's bats at Grafton Wood SSSI, Worcestershire.* People's Trust for Endangered Species and Worcestershire Wildlife Trust.

Panks, S., White, N., Newsom, A., Potter, J., Heydon, M., Meyhew, E., . . . Stone, D. (2022b). *Biodiversity Metric 3.1: Auditing and Accounting for Biodiversity: Technical Suplement.*

People's Trust for Endangered Species. (2025). *People's Trust for Endangered Species: Traditional Orchard Invetory*. Retrieved from People's Trust for Endangered Species: https://ptes.org/get-involved/surveys/countryside/traditional-orchard-survey/orchard-maps/ (accessed March 2025)

Pers. Comm. (03/03/2025). Sussex Local Wildlife SItes Initiative.

Pimley, E., Palmer, E., & Sutton, G. a. (2018). Ranging patters and habitat preferences of Bechstein's (Myotis bechsteinii) in Worcestershire. *Mammal News*, 10 - 12.

Planning Advisory Service. (2025, 02). *Biodiversity Net Gain in Local Plans and Strategic Planning*. Retrieved from Planning Advisory Service: https://www.local.gov.uk/pas/events/pas-past-events/biodiversity-net-gain-local-authorities/journey-biodiversity-net-gain

Poland, J., & Clement, C. (2009). *The Vegetative Key to the British Flora.* London: Botanical Society of the British Isles.

Price Waterhouse Cooper. (2024). *Managing Nature Risks: From understanding to action.*

Reason, P., & Wray, S. (2023). *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats, Version 1.1.* CIEEM.

Ridge, K. (2021). *Good for you, good for us, good for everybody: a plan to reduce overprescribing to make patient care better and safer, support the NHS, and reduce carbon emissions.* Department of Health and Social Care.

Rodwell, J. (1991 - 2000). *British Plant Communities Volumes 1 - 5.*

Rodwell, J. (2006). *National Vegetation Classification User's Handbook.* Peterborough: Joint Nature Conservation Committee.

Rose, F. (2006). *The Wildflower Key.* London: Penguin Books.

Russ, J. (2012). *British bat calls: a guide to species identification.* Exeter: Pelagic Publishing.

Sadler, D. (2021). *Report on dragonflies and damselflies at Sompting Brooks.*

Schofield, H., & Morris, C. (2000). *Ranging behaviour and habitat preference of female Bechstein's bat, Myotis bechsteinii (Kuhl,1818), in summer: with review of its status, distribution, behaviour and ecology in the UK.* Vincent Wildlife Trust.

Scott, C., & Altringham, J. (2014). *Developing effective methods for the systematic surveillance of bats in woodland habitats in the UK.* Leeds: DEFRA, Report WC1015.

Sheffield, U. o. (2007). Biodiversity in Urban Gardens (BUGS) - understanding nature in the garden.

SheilsFlynn. (2022). *Assessment of proposed Local Green Spaces.*

Shuker, L.J.; Gurnell, A.M.; Wharton, G.; Gurnell, D.J.; England, J.; Finn Leeming, B.; Beach, E. (2017). *MoRPh: a citizen science tool for monitoring and appraising physical habitat changes.* Water and Environment Journal, 21(3):418-424.

Sompting Estate and Ouse & Adur Rivers Trust. (2021). *Sompting Brooks River Trail Site Management Plan.*

Speak, A.F., Mizgajski, A., & Borysiak, J. (2015). Allotment gardens and parks: Provision of ecosystem services with an emphasis on biodiversity. . *Urban Forestry & Urban Greening*, 14(4), 772–781.

Speakman, J., & Racey, P. (1989). Hibernal Ecology of the Pipistrelle Bat: Energy Expenditure, Water Requirements and Mass Loss, Implications for Survival and the Function of Winter Emergence Flights. *JSTOR*, 58: 797-813.

SQW and Temple Group. (2022). *Viability Assessment of Biodiversity Net Gain in Kent.*

SQW and Temple Group. (2024). *Viability Assessment of Biodiversity Net Gain in Essex.*

Stace, C. (2019). *New Flora of the British Isles.* C&M Floristics.

Strange, E., Panzacchi, M., & van Moorter, B. (2019). *Modelling green infrastructure for conservation and land planning - a pilot study. NINA Report 1625.* Norwegian Institute for Nature Research.

Surrey Nature Partnership. (2015). *Naturally Richer: A Natural Capital Investmenr Strategy for Surrey.* Surrey Nature Parnership.

Surrey Nature Partnership. (2020). *Recommendation for adoption of 20% minimum biodiversity net gain across Surrey's planning sector: a Surrey Nature Partnership Position Statement.* Surrey Nature Partnership.

Sussex Biodiversity Record Centre. (2017). *Sussex Local Wildlife Site Selection Criteria.*

Sussex Biodiversity Records Centre. (2018). *Cokeham Brooks Local Wildlife Site boundary map and description.*

Sussex Local Wildlife Site Initiative. (2017). *Sussex Local Wildlife Site Selection Criteria.* Retrieved from https://lws-sussex.org.uk/downloads/East_and_WestSussexLWSCriteriaMay_17.pdf

Sussex Nature Partnership. (accessed 2025). Retrieved from https://sussexlnp.org.uk/boa/

The Ecology Consultancy. (2015). *Shoreham Harbour - Ecology and Green Infrastructure Study.*

The Wildlife Trusts. (2018). *The Status of England's Local Wildlife Sites.*

Tremblay, M. &. (2011). Permeability of a heterogeneous urban landscape to the movement of forest songbirds. *Journal of Applied Ecology 48*, 679-688.

Tristram, M. (01/03/2025). Personal correspondance - e-mail.

Tristram, M. (27/11/2024, November 27). *Letter*.

UKHab Ltd. (2023). *UK Habitat Classification Version 2.0 .* http://www.ukhab.org.

United Nations Environment Programne. (2019). *ECOLOGICAL CONNECTIVITY: A BRIDGE TO PRESERVING BIODIVERSITY - FRONTIERS 2018/19: EMERGING ISSUES OF ENVIRONMENTAL CONCERN CHAPTER 2.* United Nations Environment Programme.

Vincent Wildlife Trust. (2020). *Using Circuitscape to identify potential landscape corridors for the lesser horseshoe bat in Ireland.*

Wang, H., Maher, B. A., Ahmed, I. A., & Davison, B. (2019). Efficient Removal of Ultrafine Particles from Diesel Exhaust by Selected Tree Species: Implications for Roadside Planting for Improving the Quality of Urban Air. *Environmental Science & Technology, 53*(12), 6906-6916. doi:10.1021/acs.est.8b06629

Wang, J. R. (2022). Green infrastructure connectivity analysis across spatiotemporal scales: A transferable approach in teh Ruhr Metropolitan Area, Germany. *Science of the Total Environment 813*.

Wheater, C. (1999). *Urban Habitats.* Routledge, London and New York.

Woodland Trust. (Accessed 24/02/2025). *Ancient Tree Inventory*. Retrieved from ati.woodlandtrust.org.uk/tree-search

Appendix 1: Desk study

Methods

A desk study was completed to identify the ecologically sensitive areas in the study area and information within this report. It was also completed to inform the strategic significance of the baseline habitats recorded across the eight potential site allocations.

The desk study comprised:

- Review of the following data from Sussex Biodiversity Record Centre received on 10/02/2025:
  - Adur District Local Wildlife Site boundaries
  - Local Geological Site boundaries
  - Designated Road Verge boundaries
  - Designated species data (latest Adur District Quarterly Species Update).
- A review of waterbodies and watercourses that lie within the study area, using aerial imagery and publicly available information.
- DEFRA mapping (DEFRA, 2025) specifically looking at:
  - Statutory designated sites
  - Non-statutory designated sites
  - Parcels of ancient woodland
  - Parcels of Habitats of Principal Importance
- Local plan, as detailed in Section 7

Limitations

There were no limitations to the desk study.

Results

The following tables present assessment results:

- Table 16 for the BOAs, statutory and non-statutory designated sites
- Table 17 for habitats

The study area is within and adjacent to:

- Biodiversity opportunity areas

The following UK HPI in Sussex are present within the study area:

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal vegetated shingle
- Lowland mixed deciduous woodland
- Intertidal mudflats
- Saline lagoons
- Traditional orchard
- Wood-pasture and parkland
- Hedgerows
- Ponds
- Reedbeds

Table 16: Statutory and non-statutory designated sites within the study area

Type of designation	Site name	Reasons for designation	Potential site allocations that fall within/adjacent the designated site
Statutory	Adur Estuary SSSI	The Adur Estuary, and Rye Harbour, represent the only significant areas of saltmarsh between Chichester and Pagham Harbours in West Sussex, and Sandwich Bay in Kent. The estuarine plant communities are unusual due to the relative scarcity of cord-grass, Spartina spp. The intertidal mudflats within the estuary are important for a variety of wading birds. Saltmarsh plants fringe most of the estuary and in places have colonised large areas of mudflats. The intertidal mudflats of the Adur Estuary support a number of wading birds, particularly redshank, dunlin and ringed plover. The number of ringed plover regularly exceed 1% of the total British population, making the estuary of national importance for this species. A variety of species breed within the reedbed adjacent to the estuary north of the A27, including moorhen, reed warbler and sedge warbler. The estuary embankment supports a large colony of viviparous lizards.	Site E: Shoreham Gateway, adjacent
Non-statutory	Cokeham Brooks LWS Lancing Ring LWS Widewater Lagoon LWS Shoreham Beach LWS Mill Hill LWS Sidehill Scrub LWS	The local wildlife sites are protected areas which are known to support important habitats and/or a diversity of notable species. Important features of these sites includes wetland habitat within Cokeham Brooks LWS; chalk grassland within Lacing Ring LWS and Mill Hill LWS ; a lagoon supporting important bird species at Widewater Lagoon LWS ; vegetated shingle at Shoreham Beach LWS ; mixed scrub which provides an important wildlife corridor in Sidehill Scrub.	Site H: Land at Mill Hill, adjacent to Mill Hill LWS
	Shoreham Bypass NRV	This NRV is present on the north and south of the A27, east of the Shoreham Bypass. It partly overlaps with Mill Hill LWS to the west. Notable species include Small Blue and Kidney Vetch.	Site H: Land at Mill Hill, is adjacent to the southern boundary of this NRV
BOAs	Shoreham Estuary and Beach BOA	Shoreham Estuary and Beach has been recognised as a Biodiversity Opportunity Area (BOA) as it represents a priority area for the delivery of Biodiversity Action Plan (BAP) targets. This is one of 75 such areas across Sussex. The BOA covers approximately 136 hectares. This area is dominated by saltmarsh, grazing marsh and mudflats and their associated brackish communities. Shoreham Beach has some of the best vegetated shingle in the county despite high visitor pressure. There is also a saline lagoon and estuary, important for wading birds. Shoreham Airport dominates the western side, and the area is bounded by the A27 to the north and the urban areas of Shoreham and Lancing to east and west.	Site A: Car Park, Beach Green Site E: Shoreham Gateway
	Crooked Moon to Thundersbarrow BOA	Rother, Brede and Tillingham Woods has been recognised as a Biodiversity Opportunity Area (BOA) as it represents a priority area for the delivery of Biodiversity Action Plan (BAP) targets. It is one of 75 such areas across Sussex. The BOA covers approximately 201 hectares. This area runs across the A27 from Rest and Be Thankful up to Thundersbarrow hill. The North of the area has a significant amount of lowland calcareous grassland. A large proportion of this BOA is owned and managed by the National Trust.	Site D: Land North of Hill Farm Way
	Adur to Newtimber including Mill Hill BOA	The southern most section of this BOA is within the LPA just east of the Shoreham bypass. The BOA runs from Mill Hill and Old Erringham Farm in the West along the edge of the chalk to Saddlecombe, Devils Dyke and Waterhall in the East. The majority of the chalk downland in this area is owned and managed by the National Trust. There is a high density of chalk grassland habitat and several chalk springs that flow from this downland.	Site H: Land at Mill Hill

Table 17: Habitats of ecological consideration identified within the study area and potential site allocations

Habitat type	Study Area and Potential Site Allocations with the habitats of ecological consideration present
Veteran trees	The Woodlands Trust Ancient Tree Inventory lists five veteran trees recorded within the study area. No veteran trees are visible within any of the potential site allocations (Woodland Trust, Accessed 24/02/2025)
HPI Coastal and floodplain and grazing marsh	Most dominant HPI type across the study area Site C has one parcel of this HPI mapped in the western section Site E has the majority of the potential site allocation mapped as this HPI. Site G has the southern and western parts mapped as this HPI
HPI Coastal saltmarsh	Adjacent to the River Adur and along the southern coast of the study area boundary, however not within any of the potential site allocations
HPI Coastal vegetated shingle	Adjacent the southern coastal boundary of the study area boundary, however not within any of the potential site allocations
HPI Lowland mixed deciduous woodland	Present in isolated areas across the study area Site C has two parcels of this HPI mapped in the southern section of the survey area Site G has the northeastern part of the survey area mapped as this HPI.
HPI Lowland calcareous grassland	There are areas in of this habitat type in the study area boundary however they are present to the north of the boundary
HPI Lowland meadows	There are no areas of this present in the study area boundary however they are present to the north of the boundary
HPI Intertidal mudflats	Adjacent to the River Adur
HPI Saline lagoons	Present along the southern boundary, associated with the coastal habitats, of the study area.
HPI Traditional Orchard	Low number of isolated, small areas of Traditional Orchard in the study area, however there are no mapped areas of this habitat type within any of the potential site allocations
HPI Wood-pasture and Parkland	One area present in the study area boundary, however not within any of the potential site allocations
Waterbodies within the survey area	Ponds are present in the study area Site B has one ornamental pond within the survey area.
Watercourses within the survey area	The River Area flows through the centre of the study area, north to south and other ditches and watercourses are present throughout Site C has a watercourse flowing from west to east through the centre of the potential site allocations area, as well as three ditches Site E has a wet ditch on the western boundary Site G has four interconnected ditches, one is present on the western boundary, on the eastern boundary, and two go through the centre from east to west.

Appendix 2: Local Wildlife Site assessment

Methods

The aim of this assessment was to undertake a Local Wildlife Site review of three sites provided by Adur Council. To achieve this, baseline biodiversity information for each of three potential LWS (Sompting Brooks, Silver Sands & North Canal Bank) was gathered from the following sources:

- SxBRC (statutory designated sites, non-statutory designated sites, BOAs (see Figures 2), records of protected species and species of conservation concern)
- Bird records provided by Mike Tristram, Landowner and Manging Trustee of Sompting Estate
- Review of information held on the DEFRA MAGIC website and information from SxBRC (DEFRA, n.d.) (HPIs, ancient woodland), see Figure 3
- Review of information held on the Land App website (e.g. location of Public Rights of Way)
- Information provided by Adur Council including;
    - Shoreham Harbour - Ecology and Green Infrastructure Study, (The Ecology Consultancy, 2015)
    - Adur Local Plan Area - Assessment of Local Green Spaces, (SheilsFlynn, 2022)
    - Cokeham Brooks LWS Boundary Map and Description, (Sussex Biodiversity Records Centre, 2018)
    - Communication between Mike Tristram (landowner and Managing Trustee of Sompting Brooks) and Adur and Worthing Councils (Tristram, Letter, 27/11/2024). (Tristram, 01/03/2025)
    - Sompting Brooks River Trail Site Management Plan (Sompting Estate and Ouse & Adur Rivers Trust, 2021)
    - Sompting Brooks flora and fauna survey (Adur Council, 2023)

The Sussex LWS selection criteria state that the recommended selection of LWS' will be agreed by the LWS Technical Panel, in line with the habitats and species criteria and also with reference to the standard selection criteria in the DEFRA Local Sites Guidance (DEFRA, 2006). Through this assessment, the information collated was compared with the Sussex LWS Selection Criteria (Sussex Local Wildlife Site Initiative, 2017) (see Table 18, 20 and 21). A conclusion was then made as to which of the LWS criteria each site is likely to meet and where further information is required. In line with the criteria, professional judgement was used where required. Final decisions on the recommended selection of the sites as LWS will be made by a panel of local experts, the LWS Technical Panel. This report can be used as evidence by the panel.

Appendix 3A: Sompting Brooks

Basic site information

Site name	Sompting Brooks
Grid Reference	TQ1604 0526
Area (ha)	7.17
Ownership	Sompting Estate, Mike Tristram

The site supports a wide banked stream valley. The southern boundary is formed by a stream (Broadwater Brook) and bankside trees. Broadwater Brook is an ephemeral chalk spring-fed stream (Sompting Estate and Ouse & Adur Rivers Trust, 2021). The stream has recently (2019-2021) been realigned with associated marginal shelves and river banks. Other habitats include newly planted hedge and shaw woodland, wet ditches, wetland/rushy marsh, ponds, scrub, emerging field margins, mature hedgerow and boundary trees (Sompting Estate and Ouse & Adur Rivers Trust, 2021).

The eastern block is included within a Countryside Stewardship (Middle Tier) agreement. The estate is currently exploring other funding opportunities. Where opportunities are available, conservation grazing could be established once fencing and water supplies are resolved. Management is a combined effort between the Sompting Estate (machinery scale) and the 'River Ranger' volunteers – supported by the Ouse and Adur Rivers Trust (OART). The adjacent Cokeham Brooks LWSis subject to a S106 commitment in accordance with a management plan.

Does the site meet the Sussex Local Wildlife Site Selection Criteria (Sussex Local Wildlife Site Initiative, 2017)?

The site **may meet** the following criteria;

- CH2 - Habitat of Principal Importance in England
  A river (HPI) is present, in addition further HPI habitats could be present (See Appendix 1 for details).
- CS1 – Species criteria
  The notable bird and invertebrates recorded on the site as well as the presence of harvest mouse will contribute towards the eligibility of the site under the habitat criteria (See Table 18 for details). Further survey for example to determine the breeding status of birds on the site and the latest status of the notable invertebrates is likely to be required to confirm whether the site meets this criteria in isolation.

The site is **likely to meet** the following criteria;

- CH6 – Mosaic habitats
  This site would be an extension to the Cokeham Brooks LWS which lies immediately adjacent to the south and east. This site could support similar habitats to that located within the Cokeham Brooks LWS including botanically rich wetland, grassland and trees on the banks of the Cokeham Brook Stream.
- CH8 – Site expansion
  The site lies immediately adjacent to the Cokeham Brooks LWS. It is being managed as part of a wider conservation area in conjunction with Cokeham Brooks.

Supporting features

This site is particularly important for the following DEFRA Local Sites Guidance selection criteria;

- Connectivity within the landscape

  The site lies immediately adjacent to the Cokeham Brooks Local Wildlife Site and could support similar habitats to that supported within the Cokeham Brooks LWS including botanically rich wetland, grassland and trees on the banks of the Cokeham Brook Stream.

  The results of the connectivity analysis[1] indicate this site forms part of an important connectivity corridor within the landscape, the loss of which will have a high impact on connectivity. This holds particularly true along the southern boundary. This is evidenced in Figures 6 and 7 and discussed in Section 5 and 6 of this report.

- Value for appreciation of nature and learning

  The site has well managed public access with maintained information boards about the wildlife to be seen (Tristram, 01/03/2025). The Site Management Plan (Sompting Estate and Ouse & Adur Rivers Trust, 2021) aims "to connect the local community with the natural and cultural heritage of the Broadwater Brook" and "to provide opportunities for local people to develop new skills and knowledge across a range of heritage and conservation topics".

  The wider farm (Titch Hill Farm) which comprises this site "seeks to engage the public in understanding the landscape ecosystem in which we provide for people and nature, through our community farm, holiday and educational visits and tours" (Tristram, Letter, 27/11/2024).

Additional information or surveys required

To fully assess the site's eligibility for LWS status, it is recommended that a habitat survey take place in order to determine whether any HPI habitats are present and how the habitats on the site could complement the neighbouring Cokeham Brooks LWS as well as to help confirm the most suitable boundaries for the LWS if it were to be selected.

It would also be valuable to undertake further species surveys, particularly breeding birds and invertebrates to determine whether the site meets the species criteria.

[1]

Table 18: A review of Sompting Brooks against the Sussex Local Wildlife Site Selection Criteria (Sussex Local Wildlife Site Initiative, 2017)

Reference No.	Criteria	Notes	Result
Habitat Criteria Sompting Brooks			
CH1	**Sussex Biodiversity Action Plan Habitat** All areas of Sussex Biodiversity Action Plan habitat shall be eligible for selection.	This criteria is no longer relevant as the Sussex Biodiversity Action Plan no longer exists (Pers. Comm., 03/03/2025)	N/A
CH2	**Habitat of Principal Importance in England** All significant[2] areas of habitat of principal importance in England, as defined in section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, shall be eligible for selection.	The site supports a wide banked stream valley. The southern boundary is formed by a stream (Broadwater Brook) and bankside trees. Broadwater Brook is an ephemeral chalk spring-fed stream (Sompting Estate and Ouse & Adur Rivers Trust, 2021). The stream has recently (2019-2021) been realigned with associated marginal shelves and river banks. Other habitats include newly planted hedge and shaw woodland, wet ditches, wetland/rushy marsh, ponds, scrub, emerging field margins, mature hedgerow and boundary trees (Sompting Estate and Ouse & Adur Rivers Trust, 2021). A line of trees is present along the far northern boundary. Ecologist Mike Edwards identified some key wet spring flushes on the site in 2018. Since 2018, the site has benefitted from the establishment of a diverse, unfertilised and lightly grazed sward (Tristram, 01/03/2025). Rivers are a HPI. No other HPIs are identified on the site on the DEFRA MAGIC website (accessed 11/2/25). However potential HPIs that could be present include: • Arable field margins	**Potential** Further habitat survey information is required before a conclusion can be reached. **Recommend**: Habitat survey

[2] 'Significant' areas are those capable of providing a substantive contribution to the conservation of Habitat of Principal Importance in England, and/or sustaining viable species populations comprising Habitats of Principal Importance in England, and/or providing a genetic resource for species comprising Habitats of Principal Importance in England.

Reference No.	Criteria	Notes	Result
		• Purple moor-grass and rush pastures • Lowland fens • Reedbeds (present in the neighbouring cokeham brooks lws) • Floodplain grazing marsh • Lowland meadows • Ponds • Hedgerows	
CH4	**Sand Rock Exposures** All significant areas of sand rock exposures and associated habitat shall be eligible for selection.	N/A	No
CH6	**Mosaic Habitats** Sites will be eligible for selection where: **(a)** A site comprising two or more sub-habitats, each of which just fails to be selected as a Site within its own main habitat criterion group or on species grounds. Or **(b)** Where a site that would not necessarily warrant selection on its own provides a significant and clearly identifiable extension to the habitat of an adjacent or nearby LWS or other statutory designed wildlife site (e.g. SSSI). Consideration to other designated sites or land of nature conservation value in the vicinity will also be considered.	This site would be an extension to the Cokeham Brooks Local Wildlife Site which lies immediately adjacent to the south and east. This site could support similar habitats to that supported within the Cokeham Brooks LWS including botanically rich wetland, grassland and trees on the banks of the Cokeham Brook Stream.	**Likely** Depending on the results of the habitat survey, the site is likely to meet this criteria.

Reference No.	Criteria	Notes	Result
CH7	**Wildlife Corridors** Where two or more LWSs are linked by additional habitat of a type that would allow the dispersal and interchange of species within each site, adding significant conservation value to the habitat or species, then these corridors will be eligible for selection with the LWS or potential LWS sites	This site would not link two or more LWS', although it would be an extension of an existing site.	**N/A**
CH8	**Site expansion** Areas of potential habitat in close proximity to existing habitat and receiving appropriate management may be eligible for selection.	The site lies immediately adjacent to the Cokeham Brooks LWS. It is being managed as part of a wider conservation area in conjunction with Cokeham Brooks. It is managed in partnership with the Sompting Estate and the Ouse and Adur Rivers Trust who support about 30 'River Rangers' carrying out conservation management work and survey monitoring of water and wildlife (Tristram, 01/03/2025). Conservation grazing is being considered. The landowner has stated that *"The area of Cokeham Brooks LWS plus a Sompting Brooks extension is certainly a highly valuable biodiversity habitat area. In our farm conservation management we certainly think of it as a unity, bringing together two key brookland areas, the Cokeham & Sompting Brooks. These converge within the LWS into a single stream which flows south between meadows then under the railway towards Brooklands"* (Tristram, 01/03/2025). Also of note is land to the south which is identified on the DEFRA MAGIC website (accessed on 11/2/2025) as 'Open Mosaic Habitats on Previously Developed Land' (6.52ha) although it states that this is "*probably the priority habitat but some uncertainty of interpretation - historic landfill but no habitat data available".* There is also a small area (0.55ha) of deciduous woodland adjacent to the north of the site.	**Likely**

Reference No.	Criteria	Notes	Result
Species criteria Sompting Brooks			
CS1	**Species criteria** Sites supporting significant populations or relic populations of internationally, nationally or locally rare species, or species assemblages, will be eligible for selection as a LWS, or may contribute towards eligibility for consideration under the habitat criteria. For these purposes, 'supporting' may be defined as sites that either directly support breeding populations of species or provide a significant ecological function for the life cycle of that species, including resident or migratory species to the Country or region. Reference will be given to the following information: - Sussex Rare Species Inventory - Sussex Biodiversity Action Plan and evolving Sussex LNP biodiversity strategy - Natural Environment and Rural Communities Act 2006, Section 41, Habitats and Species of Principal Importance in England"	The adjacent Cokeham Brooks Local Wildlife Site is known to support a diversity of notable invertebrate and breeding bird species (Sussex Biodiversity Records Centre, 2018). As this site is likely to support similar wetland and grassland habitats, it could also support similar notable invertebrate and breeding bird species to those found on the Cokeham Brooks LWS. **Birds** Mike Galtry, a bird surveyor for the area commented that the area south of the A27 of which this site forms part is valuable for migrants. By 2021, 80 species had been recorded on the site (Sompting Estate and Ouse & Adur Rivers Trust, 2021). Birds of particular interest that have been recorded at the rushy marshland at the west of the site include jack snipe and woodcock (BOCC, Red list) (Tristram, 01/03/2025). The notable bird records returned by the Sussex Biodiversity Records Centre as well as additional records provided by Mike Tristram is summarised in the table below. Of the notable birds recorded on the site; • 17 are protected under Schedule 1, Part 1 of the WCA , including barn owl and Cetti's warbler • 13 are SPIs including reed bunting and skylark • 23 are BOCC red list species including corn bunting and skylark • 36 are BOCC amber list species The MAGIC website shows that the north west corner of the site lies within a Countryside Stewardship targeting area for corn bunting which has been recorded on the site. **Mammals** Harvest mouse, *Micromys minutus*	**Potential** The notable bird and invertebrates recorded on the site as well as the presence of harvest mouse will contribute towards the eligibility of the site under the habitat criteria. **Recommend:** Further survey for example to determine the breeding status of birds on the site and the latest status of the notable invertebrates

Reference No.	Criteria	Notes	Result
		• Recorded on site in 2017 • SPI and UK BAP Priority species • Red list GB post 2001 – Near Threatened Common pipistrelle, *Pipistrellus pipistrellus* (SPI, WCA) has also been recorded on the site. **Invertebrates** The site supports a diverse Odonata population with 18 species having been recorded on the site, 17 of which were recorded in 2021 (Sadler, 2021). Six invertebrate SPIs have been recorded on the site: • Brown-banded carder bee, *Bombus humilis* Sussex rare (latest record 2017) • Small heath butterfly, *Coenonympha pamphilus* Red list GB–Near Threatened (latest record 2022) • Blood-vein moth, *Timandra* comae (latest record 2019) • Spinach moth, *Eulithis mellinata* (latest record 2020) • Lackey moth, *Malacosoma neustria* (latest record 2020) • Cinnabar moth, *Tyria jacobaeae* (latest record 2020) The following additional Sussex rare invertebrates have been recorded on the site: • Bryony mining bee, *Andrena florea* (latest record 2020) • Adonis ladybird, *Hippodamia variegata* (latest record 2020) • Banded general, *Stratiomys potamida* (latest record 2009) • Green dock beetle, *Gastrophysa viridula* (latest record 2019) • Long-winged cone-head, *Conocephalus fuscus* (latest record 2020) • Roesel's Bush-cricket, *Roeseliana roeselii* (latest record 2020) • Wasp spider, *Argiope bruennichi* (latest record 2017)	is likely to be required in order to determine whether the site meets this criteria in isolation.

Reference No.	Criteria	Notes	Result
		The MAGIC website shows that the north west corner of the site lies within a Countryside Stewardship targeting area for **brown hairstreak** **Reptiles** Slow worm, common lizard and a breeding population of grass snake (all, SPI and WCA) have been recorded on the site (most recent record 2021) (Sompting Estate and Ouse & Adur Rivers Trust, 2021). **Plants** A detailed plant list was not available at the time of writing this report. However there is a record for field scabious, *Knautia arvensis* (Red list England post 2001 – Near Threatened) from 2020. In addition four orchid species (bee, southern marsh, pyramidal and common spotted) have been observed within the site (Tristram, 01/03/2025).	
The Sussex Local Wildlife Site Selection Criteria state that the recommended selection of LWSs will be agreed by the LWS Technical Panel, in line with the habitats and species criteria listed above, but also with reference to the standard selection criteria in the DEFRA Local Sites Guidance (DEFRA, 2006) listed below.			
General criteria (DEFRA, 2006) **Sompting Brooks**			
N/A	Size or extent	The site covers 7.17ha. Although this is relatively small, when combined with the Cokeham Brooks LWS, the entire area covers a larger 22.54ha.	Low
N/A	Diversity	The site supports a diversity of habitats including an ephemeral chalk spring-fed stream, newly planted hedge and shaw woodland, wet ditches, wetland/rushy marsh, wet spring flushes, ponds, scrub, emerging field margins, mature hedgerow and boundary trees (Sompting Estate and Ouse & Adur Rivers Trust, 2021). Further survey would reveal more detail about the diversity of habitats present. A diversity of bird, invertebrate, reptile and mammal species have been recorded (see CS1 above).	Moderate

Reference No.	Criteria	Notes	Result
N/A	Naturalness	The habitats on site have been influenced by the land use forming part of Titch Hill farm. The stream has recently been realigned in order to help restore its more natural form. Two non-native invasive species have been recorded on the site; Harlequin ladybird, *Harmonia axyridis* and giant hogweed, *Heracleum mantegazzianum.* A management system is in place for the control of giant hogweed on the site (Sompting Estate and Ouse & Adur Rivers Trust, 2021).	Moderate
N/A	Rare or exceptional feature	A number of notable species have been recorded on the site (see CS1 above).	Moderate
N/A	Fragility	Wetland habitats are particularly vulnerable to changes to weather patterns, management of the site and pollution.	Moderate
N/A	Typicalness	Unknown	Unknown
N/A	Recorded history and cultural associations	Unknown	Unknown
N/A	Connectivity within the landscape	The site lies immediately adjacent to the Cokeham Brooks Local Wildlife Site which lies just to the south and east. This site could support similar habitats to that supported within the Cokeham Brooks Local Wildlife Site including botanically rich wetland, grassland and trees on the banks of the Cokeham Brook Stream. The results of the connectivity analysis indicate this site forms part of an important connectivity corridor within the landscape, the loss of which would have a high impact on connectivity. This holds particularly true along the southern boundary. The nearest BOAs to the area include the North East Worthing Downs (supporting lowland calcareous grassland habitat) approximately 1212m to the north west and The Shoreham Estuary and Beach BOA (supporting coastal habitats) approximately 1929m to the south east.	**High**

Reference No.	Criteria	Notes	Result
N/A	Value for appreciation of nature	The site has well managed public access with maintained information boards about the wildlife to be seen (Tristram, 01/03/2025). The Site Management Plan (Sompting Estate and Ouse & Adur Rivers Trust, 2021) states four principal aims, the following two of which are relevant to this criteria: "*To connect the local community with the natural and cultural heritage of the Broadwater Brook and associated water environment by delivering community initiatives, events, activities, and access that will engage and involve people of all ages, backgrounds, and abilities with their local green space, securing its legacy and helping increase its ecological resilience into the future*." "*To provide opportunities for local people to develop new skills and knowledge across a range of heritage and conservation topics to enhance life opportunities, confidence, wellbeing, and cohesion amongst the community and provide a lasting legacy for the scheme.*" The wider farm (Titch Hill Farm) which comprises the site *"seeks to engage the public in understanding the landscape ecosystem in which we provide for people and nature, through our community farm, holiday and educational visits and tours*" (Tristram, Letter, 27/11/2024).	**High**
	Value for learning		

Table 19: Birds recorded on Sompting Brooks

Scientific name	Common Name	WCA	SPI	Red data list/ nationally scarce/ nationally rare	BoCC
Accipiter gentilis	Goshawk	Sch 1 Part 1		✓	
Accipiter nisus	Sparrowhawk			✓	Amber
Acrocephalus schoenobaenus	Sedge warbler				Amber
Alauda arvensis	Skylark		✓		Red
Anas platyrhynchos	Mallard			✓	Amber
Anser anser	Greylag goose	Sch 1 Part 2			Amber
Anthus pratensis	Meadow pipit				Amber
Apus apus	Common swift			✓	Red
Apus apus	Swift				Red
Ardea cinerea	Grey heron			✓	
Cettia cetti	Cetti's warbler	Sch 1 Part 1			
Chloris chloris	Greenfinch				Red
Chroicocephalus ridibundus	Black-headed gull			✓	Amber
Circus aeruginosus	Marsh harrier	Sch 1 Part 1		✓	Amber
Circus cyaneus	Hen harrier	Sch 1 Part 1	✓	✓	Red
Columba oenas	Stock dove				Amber
Columba oenas	Stock dove				Amber
Columba palumbus	Wood pigeon				Amber
Corvus frugilegus	Rook			✓	Amber
Cuculus canorus	Common cuckoo		✓	✓	Red
Curruca communis	Common whitethroat				Amber
Delichon urbicum	House martin			✓	Red
Emberiza calandra	Corn bunting			✓	Red
Emberiza citrinella	Yellowhammer		✓		Red
Emberiza schoeniclus	Reed bunting		✓		Amber
Falco columbarius	Merlin	Sch 1 Part 1		✓	Red
Falco peregrinus	Peregrine falcon	Sch 1 Part 1			

Scientific name	Common Name	WCA	SPI	Red data list/ nationally scarce/ nationally rare	BoCC
Falco subbuteo	Hobby	Sch 1 Part 1			
Falco tinnunculus	Common kestrel			✓	Amber
Fringilla montifringilla	Brambling	Sch 1 Part 1			
Gallinago gallinago	Common snipe			✓	Amber
Gallinula chloropus	Moorhen			✓	Amber
Ichthyaetus melanocephalus	Mediterranean gull	Sch 1 Part 1			Amber
Larus argentatus	Herring gull		✓	✓	Red
Larus canus	Common gull				Amber
Larus fuscus	Lesser black-backed gull				Amber
Larus marinus	Great black-backed gull			✓	Amber
Larus michahellis	Yellow-legged gull			✓	Amber
Linaria cannabina	Linnet		✓	✓	Red
Luscinia megarhynchos	Common nightingale			✓	Red
Milvus milvus	Red kite	Sch 1 Part 1			
Motacilla cinerea	Grey wagtail			✓	Amber
Motacilla flava	Yellow wagtail			✓	Red
Muscicapa striata	Spotted flycatcher		✓		Red
Oenanthe oenanthe	Northern wheatear				Amber
Passer domesticus	House sparrow		✓		Red
Perdix perdix	Grey partridge		✓	✓	Red
Phalacrocorax carbo	Great cormorant			✓	
Phoenicurus ochruros	Black redstart	Sch 1 Part 1		✓	Amber
Phoenicurus phoenicurus	Common redstart				Amber
Phylloscopus trochilus	Willow warbler				Amber
Plectrophenax nivalis	Snow bunting	Sch 1 Part 1		✓	Amber
Prunella modularis	Dunnock				Amber
Prunella modularis	Dunnock		✓		
Pyrrhula pyrrhula	Bullfinch				Amber

Scientific name	Common Name	WCA	SPI	Red data list/ nationally scarce/ nationally rare	BoCC
Regulus ignicapilla	Firecrest	Sch 1 Part 1			
Saxicola rubetra	Whinchat			✓	Red
Scolopax rusticola	Woodcock			✓	Red
Sterna hirundo	Common tern			✓	Amber
Streptopelia decaocto	Collared dove			✓	
Strix aluco	Tawny owl			✓	Amber
Sturnus vulgaris	Common starling			✓	Red
Sturnus vulgaris	Starling		✓		
Tadorna tadorna	Common shelduck			✓	Amber
Tringa ochropus	Green sandpiper	Sch 1 Part 1		✓	Amber
Troglodytes troglodytes	Wren				Amber
Turdus iliacus	Redwing	Sch 1 Part 1		✓	Amber
Turdus philomelos	Song thrush				Amber
Turdus pilaris	Fieldfare	Sch 1 Part 1		✓	Red
Turdus viscivorus	Mistle thrush			✓	Red
Tyto alba	Barn owl	Sch 1 Part 1			
Vanellus vanellus	Northern lapwing		✓	✓	Red

Appendix 4B: Silver Sands

Basic site information

Site name	Silver Sands
Grid Reference	TQ2304 0788
Area (ha)	2.2

Silver Sands is an even stretch of intertidal mud, sand and shingle beach on the north side of the Shoreham Beach peninsular between Sussex Wharf and Soldier's Point (SheilsFlynn, 2022). It includes the entire intertidal zone.

Does the site meet the Sussex Local Wildlife Site Selection Criteria (Sussex Local Wildlife Site Initiative, 2017)?

The site is **likely to meet** the following criteria;

- CH2 – Habitat of Principal Importance in England
  DEFRA mapping accessed on 03/03/2025 (DEFRA, n.d.) shows the majority of the site as HPI habitat: intertidal mudflats. The final decision on whether this is a 'significant' area of HPI habitat would need to be made by the LWS Technical Panel.
- CH6 – Mosaic habitats
  The site supports a mosaic of habitats including mudflat, sand, shingle and good quality semi-improved grassland habitat (non-HPI) (DEFRA, n.d.).
  The site could extend the area of protected mudflat habitat along the River Adur estuary corridor which runs from the Adur Estuary SSSI.
- CH7 – Wildlife Corridors
  Although this site does not link two or more LWS', it does form part of a corridor/stepping stones of mudflat habitat leading to the east from the Adur Estuary SSSI.
- CH8 – Site expansion
  If selected as a LWS, the site would expand the protected area of mudflat habitat along a corridor leading from the Adur Estuary SSSI.
- CS1 – Species criteria

  The site supports a population of Childing pink, *Petrorhagia nanteuilii.* This is rare both Nationally and in Sussex. There have also been records of several other notable plants, birds and invertebrates (see Table 20 for details)

Supporting features

This site is particularly important for the following DEFRA Local Sites Guidance selection criteria;

- Rare or exceptional feature
  See CS1 – species criteria above.
- Fragility

  This is only the second location (other than around Pagham Harbour) of Childing Pink in Britain. The population could be vulnerable to adverse weather, erosion or movement of shingle (Briggs, 2001).

Intertidal mudflat habitats are vulnerable to sea level rise and increased storm frequency due to climate change, pollution, flood defence schemes, human disturbance and the introduction of non-native species (BRIG (ed. Ant Maddock), 2008).

- Connectivity within the landscape

  As evidenced in Section 5 and 6, and illustrated in Figures 6 and 7, of the report, the connectivity analysis evidences the site as being part of a connectivity corridor for wildlife and is therefore important for maintaining the flow of species and genetic diversity across the landscape. The site lies 300m from the Shoreham Estuary and Beach BOA and would complement this BOA well, supporting similar habitats and providing a stepping stone of habitat in the local area (see Appendix 2 for more details).

- Value for appreciation of nature

  The Assessment of proposed Local Green Spaces (SheilsFlynn, 2022) described several of the site's features leading to opportunities for the public appreciation of nature. This includes the site's inherent beauty, views and sense of space, opportunities for public access and "*a powerful connection with nature at the tidal water's edge*." The report states that *"the combination of a relatively sandy beach and easy access (via beachfront car parking and walkway) is highly valued for recreation*."

  The Friends of Shoreham Beach Nature Reserve community group, encourages community involvement and environmental education in the wider area (SheilsFlynn, 2022).

Additional information or surveys required

To fully assess the site's eligibility for LWS status, it is recommended that a habitat survey take place to confirm the presence and quality of the mudflat HPI habitat and to help confirm the most suitable boundaries for the LWS if it were to be selected.

Table 20: A review of Silver Sands against the Sussex Local Wildlife Site Selection Criteria (Sussex Local Wildlife Site Initiative, 2017)

Reference No.	Criteria	Notes	Result
Habitat Criteria Silver Sands			
CH1	**Sussex Biodiversity Action Plan Habitat** All areas of Sussex Biodiversity Action Plan habitat shall be eligible for selection.	This criteria is no longer relevant as the Sussex Biodiversity Action Plan no longer exists (Pers. Comm., 03/03/2025)	N/A
CH2	**Habitat of Principal Importance in England** All significant[3] areas of habitat of principal importance in England, as defined in section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, shall be eligible for selection.	Silver Sands is an even stretch of intertidal mud, sand and shingle beach (SheilsFlynn, 2022). DEFRA mapping accessed on 03/03/2025 ((DEFRA, n.d.) shows the majority of the site as **HPI habitat: intertidal mudflats** with some sand and gravel – with the south east and south west corners supporting good quality semi-improved grassland habitat (non-HPI). Mudflats are widespread in the UK covering approximately 270,000ha. They are highly productive areas which, together with other intertidal habitats, support large numbers of predatory birds and fish. They also provide feeding and resting areas for internationally important populations of migrant and wintering wildfowl (BRIG (ed. Ant Maddock), 2008).	**Likely** LWS Technical Panel to discuss whether this is a 'significant' area of HPI habitat.
CH4	**Sand Rock Exposures** All significant areas of sand rock exposures and associated habitat shall be eligible for selection.	No information available to suggest that Sand Rock Exposures are present on this site.	**Unknown**

[3] 'Significant' areas are those capable of providing a substantive contribution to the conservation of Habitat of Principal Importance in England, and/or sustaining viable species populations comprising Habitats of Principal Importance in England, and/or providing a genetic resource for species comprising Habitats of Principal Importance in England.

Reference No.	Criteria	Notes	Result
CH6	**Mosaic Habitats** Sites will be eligible for selection where: **(a)** A site comprising two or more sub-habitats, each of which just fails to be selected as a Site within its own main habitat criterion group or on species grounds. Or **(b)** Where a site that would not necessarily warrant selection on its own provides a significant and clearly identifiable extension to the habitat of an adjacent or nearby LWS or other statutory designed wildlife site (e.g. SSSI). Consideration to other designated sites or land of nature conservation value in the vicinity will also be considered.	The Adur Estuary SSSI lies 1275m to the west of the site. The SSSI was notified for its significant areas of saltmarsh habitat and intertidal mudflats which are important for wading birds. The estuary is of national importance for Ringed Plover. Mudflat habitat continues to the east of the SSSI along the River Adur estuary providing a corridor of that habitat until approximately 355m to the west of the site. This site could therefore extend the area of protected mudflat habitat along that corridor. In addition there is an extensive area of the (nationally important) coastal vegetated shingle approximately 300m to the south (Shoreham Beach LWS and LNR) (SheilsFlynn, 2022) which compliments the habitats found on this site. The presence of the good quality semi-improved grassland habitat (non-HPI) on the site (DEFRA, n.d.) also adds to the mosaic of habitats on the site.	**Likely**
CH7	**Wildlife Corridors** Where two or more LWSs are linked by additional habitat of a type that would allow the dispersal and interchange of species within each site, adding significant conservation value to the habitat or species, then these corridors will be eligible for selection with the LWS or potential LWS sites	Although this site does not link two or more LWSs, as discussed above it does form part of a corridor/stepping stones of mudflat habitat leading to the east from the Adur Estuary SSSI which is of national importance for Ringed Plover which rely on the mudflat habitat. In addition, there is an extensive area of the (nationally important) coastal vegetated shingle approximately 300m to the south (Shoreham Beach LWS and LNR) (SheilsFlynn, 2022) to which this site supports complementary habitats.	**Likely**

Reference No.	Criteria	Notes	Result
CH8	**Site expansion** Areas of potential habitat in close proximity to existing habitat and receiving appropriate management may be eligible for selection.	As discussed above, if selected as a LWS, the site would expand the protected area of mudflat habitat along a corridor leading from the Adur Estuary SSSI.	**Likely**
Species criteria Silver Sands			
CS1	Sites supporting significant populations or relic populations of internationally, nationally or locally rare species, or species assemblages, will be eligible for selection as a LWS, or may contribute towards eligibility for consideration under the habitat criteria. For these purposes, 'supporting' may be defined as sites that either directly support breeding populations of species or provide a significant ecological function for the life cycle of that species, including resident or migratory species to the Country or region. Reference will be given to the following information: • Sussex Rare Species Inventory • Sussex Biodiversity Action Plan and evolving Sussex LNP biodiversity strategy	**Plants** Childing pink, *Petrorhagia nanteuilii* • Listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended). • Nationally rare • Sussex rare • GB Red list post 2001 - Vulnerable • England Red list post 2001 – Vulnerable This species grows on coastal sand and shingle and in Britain is now found only in West Sussex, with most records around Pagham Harbour. Populations of this species fluctuate considerable year to year as it prefers hot summers which ensure good seed production (Briggs, 2001). The most recent record on this site is July 2024. 3364 flowering spikes of this plant were recorded on the site in June 2023. Bulbous meadow-grass, *Poa bulbosa* • Recorded as present in 1997 • Nationally scarce	**Likely** Due to the population of Childing Pink.

Reference No.	Criteria	Notes	Result
	• Natural Environment and Rural Communities Act 2006, Section 41, Habitats and Species of Principal Importance in England“	• Sussex rare Sand sedge, *Carex arenaria* • Recorded as present in 1993 • Sussex rare Ragged-robin, *Silene flos-cuculi* • Recorded as present in 2015 • Red list England Post 2001 – Near Threatened **Birds** The following notable birds have been recorded on the site; Black-tailed godwit, *Limosa limosa* • Recorded as present in April 2023 • Listed on Schedule 1 part 1 of Wildlife and Countryside Act 1981 (as amended) • Species of Principal Importance • BOCC red listed species • Red list global post 2001 – Near Threatened Black redstart, *Phoenicurus ochruros* • Recorded as present in March 2021 • Listed on Schedule 1 part 1 of Wildlife and Countryside Act 1981 (as amended) • BOCC amber listed species In addition two BOCC amber list species, Brent Goose, *Branta bernicla* and Iceland Gull, *Larus glaucoides* have been recorded as present in February 2021. **Invertebrates**	

Reference No.	Criteria	Notes	Result
		A beetle, *Bembidion ephippium* • 12 adults recorded in 1887 • Nationally scarce • Sussex rare	
The Sussex Local Wildlife Site Selection Criteria state that the recommended selection of LWSs will be agreed by the LWS Technical Panel, in line with the habitats and species criteria listed above, but also with reference to the standard selection criteria in the DEFRA Local Sites Guidance (DEFRA, 2006) listed below.			
General criteria (DEFRA, 2006) **Silver Sands**			
N/A	Size or extent	The site is small covering just 2.2ha – however it forms part of a corridor/stepping stones of mudflat habitat stretching from the Adur Estuary SSSI and to the east.	Moderate
N/A	Diversity	The majority of the site supports intertidal mudflats with some sand and gravel – with the south east and south west corners supporting good quality semi-improved grassland habitat (non-HPI). A diversity of plant, bird and invertebrate species have been recorded (see CS1 above).	Moderate
N/A	Naturalness	This is a natural area of intertidal mud, sand and shingle beach. One invasive non-native species was recorded on the site in 2016: Japanese Rose, *Rosa rugosa.*	Moderate
N/A	Rare or exceptional feature	Supports Childing Pink (nationally rare and protected).	**High**

Reference No.	Criteria	Notes	Result
N/A	Fragility	This is only the second location (other than around Pagham Harbour) of Childing Pink in Britain. The population could be vulnerable to adverse weather, erosion or movement of shingle (Briggs, 2001). Intertidal mudflat habitats are vulnerable to sea level rise and increased storm frequency due to climate change, pollution, flood defence schemes, human disturbance and the introduction of non-native species (BRIG (ed. Ant Maddock), 2008).	**High**
N/A	Typicalness	Unknown	Unknown
N/A	Recorded history and cultural associations	*"Reference to the historic (1899) Ordnance Survey map shows that the site was part of the sand and mudflats on the margins of the broad shingle spit that contained the lower Adur Estuary. It has some historical significance as a component of the historic townscape of Shoreham Harbour and makes a minor contribution to the historic landscape setting of the Kingston Buci Lighthouse (a grade II listed building) on Kingston Beach. The 1958 OS Map indicates a ferry crossing between the northern part of the Soldier's Point site and Kingston Beach, suggesting that this part of the harbour shoreline was a functional part of the public realm at this time."* (SheilsFlynn, 2022)	Moderate

Reference No.	Criteria	Notes	Result
N/A	Connectivity within the landscape	"The site is part of the foreshore and provides continuity of coastal shingle and inter-tidal habitat around the shoreline of the Shoreham Beach Peninsula." (SheilsFlynn, 2022). The Shoreham Estuary and Beach BOA including the Shoreham Beach LWS and LNR lies just over 300m to the south of the site at its nearest point. This BOA includes areas of clay, silt and sand along the coastal area including the Adur Estuary SSSI. The Shoreham Beach LWS supports an extensive area of (nationally important) coastal vegetated shingle. Silver Sands would complement this BOA well, supporting similar habitats and providing a stepping stone of habitat in the local area. As evidenced in Section 5, 6 and presented in Figures 6 and 7 of the report, the connectivity analysis evidences the site as being part of a connectivity corridor for wildlife and is therefore important for maintaining the flow of species and genetic diversity across the landscape.	**High**

Reference No.	Criteria	Notes	Result
N/A	Value for appreciation of nature	*"Silver Sands is an attractive, sweep of foreshore with an inherent beauty and a strong sense of place." (SheilsFlynn, 2022)* *"It is a relatively sheltered spot, with views across the western arm of Shoreham Harbour to the commercial buildings and car parks on the north bank of the Adur Estuary and the harbour." (SheilsFlynn, 2022)* *"This shoreline provides opportunities for public access to the shingle beach and tidal foreshore, with exposure to the elements and superb harbour views... It is highly valued as a place that provides a respite from urban life… it offers a powerful connection with nature at the tidal water's edge." (SheilsFlynn, 2022)* *"The combination of a relatively sandy beach and easy access (via beachfront car parking and walkway) is highly valued for recreation. The walkway along the Adur Tidal Wall flood defences provides public access to the site and forms part of the promoted walking route along the Adur Estuary and is well used by walkers. It is a component of the self guided information trails along the Adur Tidal Walls flood defences between Shoreham Fort and Old Shoreham, There is public car parking along parts of the beach frontage and access to the river via the private Shoreham Harbour Club slipway." (SheilsFlynn, 2022)* *"The site is within walking distance of the centre of Shoreham-by-Sea (via the pedestrian Adur Ferry Bridge) and the Shoreham Beach shoreline walk and is accessible by car." (SheilsFlynn, 2022)*	**High**

Reference No.	Criteria	Notes	Result
N/A	Value for learning	*"There* is a Friends of Shoreham Beach Nature Reserve community group, which encourages community involvement and environmental education in the wider area, including Silver Sands." (SheilsFlynn, 2022).	Moderate

Appendix 5C: North Canal Bank

Basic site information

Site name	North Canal Bank
Grid Reference	TQ2494 0504
Area (ha)	1.79

This site comprises two linear strips of land to the south of Fishersgate Terrace/Albion Street (A259) north of Shoreham Harbour.

The larger western strip runs between Colebrook Road in the west and Williams Street in the east. It is approximately 1.3km long and supports south facing bank exposed to coastal wind. The Shoreham Harbour Ecology and Green Infrastructure Study describes it as "*largely comprised of a mosaic of grassland, tall-ruderal vegetation and scrub/trees, with smaller amounts of hard-standing, ephemeral/short perennial vegetation, bare ground and exposed cliffs, scattered coastal/vegetated shingle plants and non-native hedgerows. Amenity, species-poor semi-improved and semi-improved grassland types are also present… The sward was species-rich in localised areas, particularly above North Canal Bank Slip where it is short and dry/parched*" (The Ecology Consultancy, 2015).

The smaller eastern section runs between Mill Road in the west and Brambledean Road in the east. It supports a "*mosaic of tall ruderal vegetation (c.5%), scrub and scattered trees (c.25%) and grassland (c.70%). The majority of the grassland was species-poor semi-improved but c.10% of the site area comprised semi-improved neutral to calcareous grassland with a more diverse assemblage of grasses and wildflowers. The mix of both native and non-native species increases the diversity*" (The Ecology Consultancy, 2015).

Does the site meet the Sussex Local Wildlife Site Selection Criteria (Sussex Local Wildlife Site Initiative, 2017)?

The site **may meet** the following criteria;

- CH2 - Habitat of Principal Importance in England

  Unlikely - An up to date habitat survey is required to determine whether any HPIs are present on the site. Possible HPIs include coastal vegetated shingle, lowland meadow and/or lowland calcareous grassland. However if present, these are only likely to be present over very small areas.

  CH6 – Mosaic Habitats

  Unlikely - The site supports a good mosaic of habitats. Whether the site meets this criteria will depend on the value and extent of the habitats as determined by an up to date habitat survey.

- CS1 – Species criteria

  A survey in 2009 found the site to support an exceptional population of common lizard, *Zootoca vivipara* and a good population of slow-worm *Anguis fragilis*. Records of two notable plant species and the nationally scarce grey bush cricket *Platycleis albopunctata* exist (see Table 21 for details). The final decision on whether these are significant populations would need to be made by the LWS Technical Panel.

It has also been suggested that the large area of relatively undisturbed dense scrub is high quality nesting habitat for breeding birds and could support declining species such as linnet *Linaria cannabina* and starling, *Sturnus vulgaris* as well as be of potential value to a number of specialist invertebrates such as white letter hairstreak, *Satyrium w-album* (The Ecology Consultancy, 2015). Further survey would be required to determine whether this is the case.

Supporting features

This site is particularly important for the following DEFRA Local Sites Guidance selection criteria;

- Connectivity within the landscape
  Section 5 and 6, and figures 6 and 7, of the report evidences the site's importance as a connectivity corridor, particularly to the east which shows a key corridor. This is particularly pertinent given the dense development in this part of Shoreham/Adur.

Additional information or surveys required

To fully assess the site's eligibility for LWS status, it is recommended that an up to date habitat survey take place in order to determine whether any HPI habitats are present.

It would also be valuable to undertake species surveys, particularly reptiles, breeding birds and invertebrates to determine whether the site meets the species criteria.

Table 21: A review of North Canal Bank against the Sussex Local Wildlife Site Selection Criteria (Sussex Local Wildlife Site Initiative, 2017)

Reference No.	Criteria	Notes	Result
Habitat Criteria North Canal Bank			
CH1	Sussex Biodiversity Action Plan Habitat All areas of Sussex Biodiversity Action Plan habitat shall be eligible for selection.	This criteria is no longer relevant as the Sussex Biodiversity Action Plan no longer exists (Pers. Comm., 03/03/2025)	N/A
CH2	Habitat of Principal Importance in England All significant[4] areas of habitat of principal importance in England, as defined in section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, shall be eligible for selection.	DEFRA mapping accessed 03/03/2025 (DEFRA, n.d.) does not identify any HPI habitat within the site. Bearing this in mind and the habitat descriptions below obtained from (The Ecology Consultancy, 2015), there could potentially be small areas of coastal vegetated shingle HPI habitat present. The presence of other HPI habitat is unlikely unless parts of the site have improved through management since 2015 to lowland meadow or lowland calcareous grassland. The Shoreham Harbour Ecology and Green Infrastructure Study describes most of this site (Site 11 in (The Ecology Consultancy, 2015)) as "*largely comprised of a mosaic of grassland, tall-ruderal vegetation and scrub/trees, with smaller amounts of hard-standing, ephemeral/short perennial vegetation, bare ground and exposed cliffs, scattered coastal/vegetated shingle plants and non-native hedgerows. Amenity, species-poor semi-improved and semi-*	Unlikely More detailed and up to date habitat survey recommended.

[4] 'Significant' areas are those capable of providing a substantive contribution to the conservation of Habitat of Principal Importance in England, and/or sustaining viable species populations comprising Habitats of Principal Importance in England, and/or providing a genetic resource for species comprising Habitats of Principal Importance in England.

Reference No.	Criteria	Notes	Result
		improved grassland types are also present… The sward was species-rich in localised areas, particularly above North Canal Bank Slip where it is short and dry/parched… The water's edge immediately to the east of North Canal Bank Slip comprised an area of foreshore protected by rocks and artificial substrates. A narrow band of grassland had developed on the upper bank with scattered coastal/shingle plants." (The Ecology Consultancy, 2015). The eastern section of the site (Site 8 in (The Ecology Consultancy, 2015) is described as a "*south facing bank with a mosaic of tall ruderal vegetation (c.5%), scrub and scattered trees (c.25%) and grassland (c.70%). The majority of the grassland was species-poor semi-improved but c.10% of the site area comprised semi-improved neutral to calcareous grassland with a more diverse assemblage of grasses and wildflowers. The mix of both native and non-native species increases the diversity*."	
CH4	Sand Rock Exposures All significant areas of sand rock exposures and associated habitat shall be eligible for selection.	No information available to suggest that Sand Rock Exposures are present on this site.	Unknown
CH6	Mosaic Habitats Sites will be eligible for selection where: (a) A site comprising two or more sub-habitats, each of which just fails to be selected as a Site within its own main habitat criterion group or on species grounds.	The Shoreham Harbour Ecology and Green Infrastructure Study described the main value of the site *as "the intimate mix of scrub, grassland and tall-ruderal present and patches of coastal/vegetated shingle pla*nts" (The Ecology Consultancy, 2015)" Some small areas of species rich grassland were present. The Adur Estuary SSSI lies approximately 2950m to the west of the site. The SSSI was notified for its significant areas of saltmarsh	Unlikely More detailed and up to date habitat survey recommended.

Reference No.	Criteria	Notes	Result
	Or (b) Where a site that would not necessarily warrant selection on its own provides a significant and clearly identifiable extension to the habitat of an adjacent or nearby LWS or other statutory designed wildlife site (e.g. SSSI). Consideration to other designated sites or land of nature conservation value in the vicinity will also be considered.	habitat and intertidal mudflats which are important for wading birds. The estuary is of national importance for Ringed Plover.	
CH7	Wildlife Corridors Where two or more LWSs are linked by additional habitat of a type that would allow the dispersal and interchange of species within each site, adding significant conservation value to the habitat or species, then these corridors will be eligible for selection with the LWS or potential LWS sites	Due to the linear nature of this site, this site provides a wildlife corridor for wildlife (see 'connectivity in the landscape' criteria below) however it does not connect two or more LWSs.	No
CH8	Site expansion Areas of potential habitat in close proximity to existing habitat and receiving appropriate management may be eligible for selection.	This site is not in close proximity to existing habitat.	No

Reference No.	Criteria	Notes	Result
Species criteria North Canal Bank			
CS1	Sites supporting significant populations or relic populations of internationally, nationally or locally rare species, or species assemblages, will be eligible for selection as a LWS, or may contribute towards eligibility for consideration under the habitat criteria. For these purposes, 'supporting' may be defined as sites that either directly support breeding populations of species or provide a significant ecological function for the life cycle of that species, including resident or migratory species to the Country or region. Reference will be given to the following information: Sussex Rare Species Inventory Sussex Biodiversity Action Plan and evolving Sussex LNP biodiversity strategy Natural Environment and Rural Communities Act 2006, Section 41, Habitats and Species of Principal Importance in England"	The Shoreham Harbour Ecology and Green Infrastructure Study (The Ecology Consultancy, 2015) recommended further surveys of North Canal Bank including reptile, botanical, breeding bird and badger. **Plants** Sea fern-grass, *Catapodium marinum,* Nationally Scarce recorded in 2015 (The Ecology Consultancy, 2015). Toothed medick, *Medicago polymorpha,* Nationally Scarce and Sussex Rare recorded in May 2022 (55 plants) **Birds** This site provides a large area of relatively undisturbed dense scrub as high quality nesting habitat for breeding birds. It could support declining species such as linnet *Linaria cannabina* and starling, *Sturnus vulgaris* (The Ecology Consultancy, 2015). **Reptiles** A reptile survey of area 11 was carried out in 2009 (Halcrow group Ltd, 2009d) - this indicated the presence of an exceptional population of common lizard, *Zootoca vivipara* and a good population of slow worm, *Anguis fragilis* following Froglife methodology (Froglife, 1999). **Invertebrates** The nationally scarce grey bush cricket Platycleis albopunctata has been recorded twice (2008 - TQ2475005000 and 2013 - TQ248050) at this site (The Ecology Consultancy, 2015).	Possibly LWS Technical Panel to discuss whether the populations of sea fern-grass, toothed medick, common lizard and grey bush cricket are 'significant' populations. Up to date botanical, invertebrate, reptile and bird surveys recommended.

Reference No.	Criteria	Notes	Result
		A cinnabar moth, *Tyria jacobaeae* larvae was recorded in July 2007. This is a SPI and UK BAP Priority species. The English elm scrub is of local interest, of potential value to a number of specialist invertebrates such as white letter hairstreak Satyrium w-album (The Ecology Consultancy, 2015).	
The Sussex Local Wildlife Site Selection Criteria state that the recommended selection of LWSs will be agreed by the LWS Technical Panel, in line with the habitats and species criteria listed above, but also with reference to the standard selection criteria in the DEFRA Local Sites Guidance (DEFRA, 2006) listed below.			
General criteria (DEFRA, 2006) North Canal Bank			
N/A	Size or extent	This is a small site covering only 1.79ha.	Low
N/A	Diversity	Good diversity of habitats present – "*intimate mix of scrub, grassland and tall-ruderal present and patches of coastal/vegetated shingle pla*nts" (The Ecology Consultancy, 2015).	Moderate
N/A	Naturalness	The following Schedule 9 exotic invasive plant species are present; Japanese knotweed *Fallopia japonica*, montbretia *Crocosmia x crocomiiflora* and wall Cotoneaster *Cotoneaster horizontalis* (The Ecology Consultancy, 2015).	Low
N/A	Rare or exceptional feature	Nationally scarce grass – Sea fern-grass, *Catapodium marinum* A reptile survey of area 11 was carried out in 2009 (Halcrow group Ltd, 2009d) - this indicated the presence of an exceptional population of common lizard and a good population of slow worm following Froglife methodology (Froglife, 1999).	Moderate

Reference No.	Criteria	Notes	Result
		The nationally scarce grey bush cricket *Platycleis albopunctata* has been recorded twice (2008 - TQ2475005000 and 2013 - TQ248050) at this site (The Ecology Consultancy, 2015).	
N/A	Fragility	Due to the linear nature of the site, it is vulnerable to edge effects such as disturbance, pollution and the introduction of non-native species.	Moderate
N/A	Typicalness	Unknown	Unknown
N/A	Recorded history and cultural associations	The Assessment of Proposed Local Green Spaces (SheilsFlynn, 2022) states that "*There are no heritage designations on or close to the site, but it forms part of the historic evolution of the Shoreham Harbour….Reference to the historic (1899) Ordnance Survey map shows that the site was then an embankment south of the Brighton Road and a broad area of flattish land with a tow path alongside the canal. Most of the flat land beside the canal was dredged to form the new (wider) canal basin. The 1958 aerial photograph shows the configuration of land and water, with the marina to the west of the grass wharf and the fuel storage depot on the flat wharf to the south of Fishersgate.*"	Moderate
N/A	Connectivity within the landscape	This site provides an important linear wildlife corridor in a densely developed part of Shoreham/Adur. It has been described as part of "*a series of stepping stones for wildlife moving east-west across the regeneration area*." It "*forms part of the proposed ecological corridor through the Shoreham Harbour Regeneration Area, with considerable scope for habitat enhancement*" (SheilsFlynn, 2022). Section 5 and 6, and figures 6 and 7, of the report evidences the site's importance as a connectivity corridor particularly to the east.	High

Reference No.	Criteria	Notes	Result
		This is particularly pertinent given the dense development in this part of Shoreham/Adur.	
N/A	Value for appreciation of nature	The site is adjacent to residential areas and is within walking distance of the centres of both Southwick and Fishersgate. The Assessment of Proposed Local Green Spaces (SheilsFlynn, 2022) states that "*Although this site lies within an industrial landscape, the coastal setting provides a scenic backdrop and the site's open character offers some respite from urban life*." The site provides opportunities for "*striking views across the eastern arm of Shoreham Harbour to Shoreham Power Station and the South Quayside area to the south, the Lady Bee marina, Southwick Lock Gates and Shoreham harbour Mouth to the west and Aldrington Basin to the east*" (SheilsFlynn, 2022). *The North Bank Canal site is a popular venue for recreational angling... There is a network of informal paths on the steep embankment but no other recreational use."* The Shoreham Harbour - Ecology and Green Infrastructure Study states that *"proposals to improve sustainable transport links (cycle and pedestrian path) will increase the value of the site as a recreational space, but should be balanced with its ecological value."* (The Ecology Consultancy, 2015)	Moderate
N/A	Value for learning	Unknown	Unknown

Appendix 3: Potential Site Allocations – Baseline Habitat Survey

Methods

UK habitat classification survey

The UK habitat classification survey included the eight potential sites being assessed as to their suitability for allocation for development in the study area, and that were provided by the Council. These are presented in Figure 5.

To allow for clear data management for each of these potential site allocations, SWT Ecology Services then assigned each unique site reference.

The table below identifies the eight potential site allocations, and associated references as detailed in the table below:

Table 22: Potential site allocations

SWT Ecological Services Site reference	Site name
Site A	Car Park, Beach Green
Site B	Land East of Adur Close
Site C	Lancing Meadows
Site D	Land North of Hill Farm Way
Site E	Shoreham Gateway
Site F	Land at Upton Farm
Site G	Land East of Manor Close
Site H	Land at Mill Hill

Habitats in the eight potential site allocations areas were mapped using the UK habitat classification survey methodology (UKHab Ltd, 2023).

UK habitat classification survey is a comprehensive system for classifying and mapping habitats within the UK. The aim of the survey is to identify and map habitats using aerial imagery and ground-truthing the information in a consistent and unified way such that this can be used for ecological impact assessment and habitat metrics.

Seven of the eight potential site allocations listed above (Site A - G) were surveyed by SWT Ecology Services with a UK habitat survey and condition assessment, with results used to complete a baseline BNG assessment.

Regarding Site H, a UK habitat classification survey and associated BNG assessment was completed in 2024 by Bakerwell Ecological Expertise, with the results reported in a Biodiversity Net Gain Feasibility Assessment Summary Report (Bakerwell, 2024). This information was provided to SWT Ecology Services prior to any survey visit of Site H. Therefore, the survey by SWT Ecology Services of this potential site allocations on 06/03/2025 did not include a complete UK habitat classification survey and included a high level ecological walkover over site visit to verify the results of the 2024 survey, and assess if there had been any significant changes since the 2024 survey. The results of the previous 2024 report, combined with the update walkover survey completed by SWT Ecology Services in 2025, were used to inform the BNG baseline assessment and BNG modelling

The whole survey area within each of the other seven potential site allocations (Site A – G) was walked by an experienced ecologist and habitats identified, classified and mapped. Each habitat is coded in line with the survey methodology, using secondary codes to define specific features, such as management measures, land use and other specific features. Where these secondary codes are used in the report, the definitions are also provided.

Where a biodiversity net gain-specific habitat code exists this was used in preference to the UK habitat classification code to ensure alignment with the metric.

Within each habitat type a record of the vascular plant species was made and an assessment of their abundance recorded. Abundances of each vascular plant species within each habitat type are based on the DAFOR scale, presented below.

- D – Dominant
- A – Abundant
- F – Frequent
- O – Occasional
- R – Rare

The survey included an assessment of the habitats present to determine their suitability for protected species and species of conservation concern. A record was made of any signs of protected species, or species of conservation concern, such as runs, droppings and/or foraging remains.

A record was also made of any fauna that was incidentally recorded.

The presence of any non-native invasive species was noted, and their location and distribution mapped.

Notable observations were recorded during the survey as target notes.

Nomenclature of vascular plants followed appropriate sources for the plant species (BSBI, UK Center for Ecology and Hydrology, Biological Records Center, 2020) (Stace, 2019). Common names are presented in the text, with scientific names detailed in Table 35.

Fauna species mentioned in this report will be referred to by their common name. Scientific names for these species are detailed in Table 36.

The date and weather conditions are detailed in the table below. The survey of each of the potential site allocations was undertaken by Daniel Lock BSc (Hons) MSc – Ecologist.

Table 23: Survey dates and weather conditions

Site	Date	Time	Temp C	Cloud (%)	Rain	Wind[5]
Site A	04/02/25	10:30	9	100%	No rain	5 - Fresh breeze
Site B	04/02/25	12:10	10	100%	No rain	5 - Fresh breeze
Site C	04/02/25	14:15	9	100%	Light rain	4 - Moderate breeze
	05/05/25	16:15	13	60%	No rain	2 - Light breeze

[5] Beaufort scaleA5

Site	Date	Time	Temp C	Cloud (%)	Rain	Wind[5]
	06/05/25	13:30	11	30%	No rain	2 - Light breeze
Site D	05/02/25	09:00	11	40%	No rain	2 - Light breeze
Site E	05/02/25	11:15	12	30%	No rain	2 - Light breeze
Site F	05/02/25	14:45	13	90%	No rain	1 - Light air
Site G	06/02/25	09:00	8	0%	No rain	1 - Light air
Site G	06/02/25	15:00	8	0%	No rain	1 - Light air

Habitat Condition Assessment

The habitat condition assessment of sites A - G was undertaken at the same time as the UK habitat surveys by Daniel Lock BSc (Hons) MSc – Ecologist, who has the relevant skills and knowledge to assess condition for the habitats encountered. For Site H, the same approach as detailed above was completed for this element, to confirm previous information and/or identify where there has been any significant changes of condition of any of the habitats.

The habitat condition assessment involved completing the habitat condition forms in line with best practice guidance (DEFRA, 2024b). Habitat condition assessment forms were completed and the condition assigned based on the number of criteria passed for the habitat type. For some habitat types, the condition has been pre-determined, such as rhododendron and bramble scrub.

The habitat condition forms accompany this report.

Limitations

For site C, in the area south of the river, the western parts of this section were largely inaccessible owing to extremely wet, marshy conditions and the presence of dense vegetation and scrub. As such, the woodlands, scrub and wetland habitats in this area had to be assessed from a distance, from aerial imagery and other available information online. These habitats have been assessed on a precautionary basis.

During the habitat survey and mapping of the habitats for Site G: Land East of Manor Close, historical mapping indicated that an area of sparse woodland in the northern area of the site had been historically cleared (this area is also mapped as HPI woodland on Natural England's Priority Habitat inventory). Based on aerial imagery (Google Earth, Accessed 17/02/2025), this was likely to have taken place between 2007 and 2012. The habitat present in this area during the 2025 surveys, were assessed as being bramble scrub and ruderal vegetation. As the habitat clearance had been completed a significant time before January 30, 2020, when Biodiversity Net Gain (BNG) regulations came into effect, the following approach was taken:

- The habitats were assessed and mapped as they were found to be during the 2025 survey.
- To account for the fact that this area is mapped as HPI woodland on the Priority Habitat Inventory, and as woodland may have been present historically, all habitats in this area were assessed as having High Strategic Significance.

As detailed above, a full UK habitat survey and condition assessment by SWT Ecology Services was not completed of Site H as these surveys had previously been completed on the

25th March 2024 by another ecological company and the results provided to SWT Ecology Services prior to any 2025 site visit. This site was visited on the 6th February 2025 by SWT Ecology Services to assess if there had been any significant changes since the 2024 survey. This check found that there had been so significant changes to the habitats since the March 2024 survey and that the results of the previous report could be relied upon to inform the BNG baseline assessment and BNG modelling.

River MoRPH surveys were not completed as part of the baseline surveys. Site C has a river flowing through the centre of the site, and this (and the riparian marginal vegetation) was not included within the BNG assessment, and a full river Morph survey would be required to inform any formal BNG assessment.

Habitat surveys can be undertaken at any time of year, with the optimal season being between March and September, when most plant species are visible. Where feasible, all efforts were made to schedule the habitat survey in optimal weather conditions and time of year. Nevertheless, field surveys usually fail to record all species present for various reasons, including the seasonal absence of some species, and short survey duration. Rare or cryptic species are often missed in short surveys.

Based on the above, a full appraisal of the plant species and habitats present could not be undertaken at the time of the survey and the survey was not conducted within the optimal timeframe.

Habitat condition assessments should be undertaken at the optimal time of year for the habitat. The habitat condition assessment was undertaken in February which is not considered to be optimal

Measures have been taken to consider the sub-optimal timing of the habitat survey and condition assessment. These measures were mainly applied to grassland and woodland habitats where the seasonality of the survey may have impacted the observable diversity of the grasslands; establishing which tree species are present in woodlands; and the diversity of ground flora present within the woodlands. These measured were as follows:

For grasslands:

- Where the minimum number of average number of vascular plant species/m^2 required to pass criterion A (for low distinctiveness grassland: modified grassland), and criterion F (for medium or higher distinctiveness grasslands) recorded during the February 2025 survey was just below (i.e. failed by only one specie/m^2) to minimum threshold for relevant criteria, this criteria was automatically passed to account for the potentially lower diversity of species visible. Where the value was significantly below the thresh hold, these criteria were still failed.

For woodlands:

- To account for the winter survey period, and the difficulty in identifying trees by buds and bark, across all woodlands for criterion D for the number of native tree species, the maximum of three points was given. This was based on the ecologist's awareness of type of woodland habitat, and tree species, present in the Adur Local Plan area
- To account for the winter survey period, and the potential lack of ground flora, across all woodlands for criterion I for the presence of ground flora, the maximum of three

points was given. This was based on the ecologist's awareness of type of woodland habitat, and tree species, present in the Adur Local Plan area.

Results

UK habitat classification

The UK habitat classification survey and habitat condition assessment results are detailed in the tables below, with the figure given for each site. Habitat condition forms and a completed biodiversity net gain metric, detailing the baseline conditions, accompanies this report and must be read in conjunction with this report

Table 24: Site A, Car Park, Beach Green habitat survey results

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1c: Artificial unvegetated, unsealed surface	A1	Car parking area consisting of compacted gravel and earth, with large puddles.	Not applicable	No	
h3d: Bramble scrub	A2	Area of bramble scrub at eastern entrance to car park • Bramble d • Cock's-foot o • Cow parsley o • False oat-grass o • Alexanders f • Rosebay willowherb r	Poor	No	
u1 - 81: Ruderal/Ephemeral	A3	Area of ruderal vegetation, next to bramble scrub area A2 at entrance of car park. The ruderal vegetation is dominated by alexanders. • Alecander d • Cock's-foot r • Cow parsley o, • Ivy o, • Common nettle r	Poor	No	
h3d: Bramble scrub	A4	Parcel of bramble scrub on southern survey area boundary Species include: • Bramble d • Alexanders f • Teasel r • Butterfly-bush r • Cock's-foot o • False oat-grass o • Cow parsley o	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
h3d: Bramble scrub	A5	Bramble scrub in the west of the survey area around the sewage pumping station. A large flock of house sparrows present in scrub. • Bramble d • Alexanders f • Fly honeysuckle r • Teasel o • Butterfly-bush o	Poor	No	
u1b: Developed land; sealed surface	A6	Area of concrete with concrete blocks in the north east corner of the sewage pumping station.	Not applicable	No	
g3c: Other neutral grassland	A7	Area of grassland present around the perimeter of the car park. Has developed on the gravel of the car park area and appears to have thin soils. Sward height is varied from hip height to 5cm. There are large patches of bramble and ruderal. There is a lot of littering, especially garden waste at the rear of the residential properties. The are many species indicative of enrichment and the area is popular with dog walkers and there is a lot of dog mess. There are localised areas of bare ground • False oat-grass a • Cock's-foot a • Yorkshire-fog f • Meadow vetchling o • Bramble f • Cow parsley f • Ribwort plantain f • Alexanders f • Common mallow r • Creeping cinquefoil o • Bristly oxtongue • Fescue sp. o • Upright hedge parsley o • Dandelion o • Dove's-foot crane's-bill o • Common couch a • Ragwort o • Butterbur o • Teasel f • Dog rose r	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
NE0014: Urban tree	GA1 TA2	1. Three black poplar, Two large and one medium, on southern survey area boundary. 2. One small, planted cherry growing next to chain link fencing around sewage pumping station	Good	No	
Target Note		**Description**			**Photograph**
TN1		Garden waste at rear of residential properties			

Table 25: Site B, Land East of Adur Close habitat survey results

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
h3d: Bramble scrub	B1	The majority of the site is covered with dense bramble scrub on what was previously grassland. Bramble dominates, with high densities of field bind weed. There are high densities of ruderal species such as common nettle, creeping thistle, curled dock and rosebay willowherb. There are some garden escapees also present, including pampas grass. • Bramble d • Field bindweed a • Common nettle f • Curled dock f • Creeping thistle f • Rosebay willowherb f • Pampas grass r	Poor	No	
r1g – 46: Ponds; ornamental lake or pond	B2	This is an artificial pond in the grassland are B3. It has a plastic liner and is fed by a hose. This pond is not actively managed and is choked with vegetation including the schedule 9 New Zealand pygmy weed. Pond water quality was good. Common duckweed was present and covered much of the pond surface. The pond was partially shaded by tree TB5, but at less than 50%. Species include: • New Zealand pygmy weed D • White water lily sp. o • Common duckweed a	Poor	No	

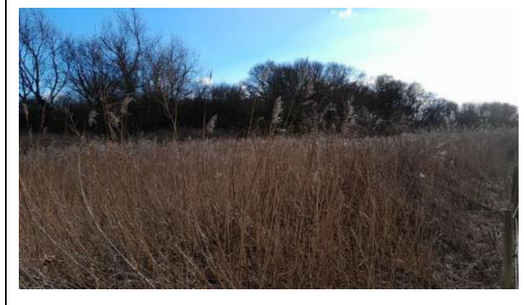
Habitat and code	Compartment number	Description	Condition	HPI	Photograph
g3c: Other neutral grassland	B3	Area of grassland along the southwestern boundary of the survey area. Speaking to a nearby resident, much of the survey area was previously managed as a grassland and the fence that currently encloses was not present. Since the erection of the fence, the management has ceased and much of the scrub has developed. The whole of the survey area is mapped as non-priority good quality semi-improved grassland on MAGIC. This grassland had a varied sward height with tussocks and very little bare ground present. There were some garden escapees present including New Zealand flax, ornamental rose and grape hyacinth. Species indicative of sub-optimal condition present including ragwort, creeping thistle and curled dock. Average species richness across three quadrats was 5, and 4.33 when excluding species indicative of sub-optimal condition. Species include: • Yorkshire-fog d • Perennial rye-grass o • White clover o • Bedstraw sp. o • Small-flowered crane's-bill o • False oat-grass f • Cock's-foot f • Creeping thistle o • Ragwort o • Sedge sp. r • Dove's-foot crane's-bill r • Curled dock r • Bramble o • Ornamental rose r • New Zealand flax r • Grape hyacinth o	Poor	No	
g3c: Other neutral grassland	B4	Area of grassland next to road. This grassland appears frequently mown and is managed to a short uniform sward length of c.5-10cm in height. There are some localised areas of bare ground present. Species of sub-optimal condition are present including white clover and creeping buttercup. Average species richness across three quadrats was 7, and 5.67 when excluding species indicative of sub-optimal condition. Species include: • Perennial rye-grass a • White clover f • Yorkshire-fog f • Ribwort plantain o • Daisy o • Dandelion o • Creeping buttercup o • Yarrow o • Common mouse-ear o • Dove's-foot crane's-bill o • Cow parsley o	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
NE0014: Urban tree	TB1 – TB10	1. One small blackthorn 2. One small hawthorn 3. One small hawthorn 4. Five medium hawthorns with dense ivy cover 5. One small ornamental prunus species 6. One small, planted cherry 7. One medium Lawsons Cyperus 8. One large crack willow with dense ivy cover. 9. One small hawthorn with dense bramble cover 10. One small elder with dense bramble cover	Multiple	No	
Target Note		**Description**			**Photograph**
TN1		Mammal trail leading under fence to west of the survey area.			

Table 26: Site C, Lancing Meadows habitat survey results

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
g1a6: Other lowland dry acid grassland	C1	This parcel is a grassland field, it is periodically grazed by horses, although no horses present at the time of the survey. Rabbits were seen in this field. Sward length was uniform across the survey area and very short and uniform, from 2-7cm. Many localised areas of bare ground present, including from rabbit activity. Soils appear thin and well drained, with species indicative of acidic soils present including common sorrel and creeping bent, and this field falls on Soilscape 6: Freely draining slightly acid loamy soils, whereas the rest of the habiatts in the survey area fall on Soilscape 21: Loamy and clayey soils of coastal flats with naturally high groundwater (Landis, Accessed 24/02/2025) Species indicative of sub-optimal conditions are present and include curled dock, creeping buttercup and spear thistle. Average species richness across five quadrats was 8.8, and 6.6 when excluding species indicative of sub-optimal condition. This field is mapped as non-HPI good quality semi-improved grassland on MAGIC. Species include: • Perennial rye-grass a • White clover f • Common bent a • Yorkshire-fog a • Yarrow f • Creeping buttercup f • Common mallow r • Dove's-foot crane's-bill o • Common sorrel o • Ribwort plantain f • Daisy o • Spear thistle r • Curled dock o • Creeping cinquefoil o • Dandelion o • Common mouse-ear o • Common chickweed o • Bramble o • Pearlwort sp. r • Lesser burdock r • Common nettle o	Moderate	No	
h3d: Bramble scrub	C2	This parcel is an area of dense bramble scrub along a fence line on the eastern field (compartment C30) boundary.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
w1-33: Line of trees	C3	On the northern boundary of field C1 is a line of trees dominated by crack willows. The willows present are mature and pollarded, and a majority have features of veterenisation including frost cracks, rot holes, loose and lifting bark. Bramble scrub is present beneath some areas. The trees present are three small willow, ten medium willow, eleven large willow, eleven small elder and two small cypress. Species include: • Crack willow d • Elder a • Lawsons cypress r • Bramble a • Lords-and-ladies o	Moderate	No	
h3d: Bramble scrub	C4	On the western boundary of the field (compartment C1) are strips of dense bramble scrub along a fence line. There are some scattered hawthorn and elder trees within the scrub. Species include: • Bramble d • Hawthorn r • Elder r • Cow parsley o • Common nettle f • Creeping thistle o	Poor	No	
g3c: Other neutral grassland	C5	This parcel is a grassland field in the north-western central area of the survey area, a river/stream is present on its southeastern boundary and there is a strip of aquatic marginal vegetation present. The grassland was very wet at the time of the survey, with areas of standing open water. This field is likely to be periodically grazed by horses, although none were present at the time of the survey. The sward height is varied with at least 20% under 7cm and at least 20% over 7cm, and the grasses are forming tussocks in places. There are a small number of localised areas of bare ground. Species indicative of sub-optimal condition are present and include white clover, creeping buttercup and curled dock. Average species richness across four quadrats was 7.5 and 5.75 when excluding species indicative of sub-optimal condition (due to time constraints four not five quadrats were taken)(. This field is mapped as non-HPI good quality semi-improved grassland on MAGIC. Species include: • Perennial rye-grass f • White clover o • Yorkshire-fog a • Ribwort plantain f • Yarrow f • Creeping cinquefoil f • Dandelion r • Common bent f • Curled dock o • Creeping thistle d • Creeping buttercup o	Good	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
h2a: Native hedgerow	C6	On the northwestern boundary of the field (compartment C5), adjacent to a residential property is a defunct native hedgerow. The hedgerow is unmanaged with the shrubs developing into trees. There is a large vertical gap between the ground and the canopy, and many horizontal gaps are present between hedgerow shrub. There is a lot of litter and some fly tipping within the hedgerow. Species include: • Elder a • Hawthorn o • Bramble a • Common nettle a • Cow parsley o • Curled dock o	Moderate	No	
h3h: Mixed scrub	C7	This is an area of dense mixed scrub on the northern field boundary (compartment C5) , it lies on the banks of a ditch/tributary to the river, that is outside of the survey area. The scrub has some mature shrubs of blackthorn and elder, with a growth pattern indicting strong winds. Species include: • Bramble a • Blackthorn f • Hawthorn o • Elder o • Alder r • Common nettle a	Good	No	
h3d: Bramble scrub	C8	On the southern field boundary (compartment C12) is an area of dense bramble scrub, forming adjacent to the ditch/stream that falls outside of the survey area. There are a small number of mature shrubs of elder and hawthorn, and these are mapped separately as individual trees. Species include: • Bramble d • Elder r • Hawthorn r • Common nettle a • Cow parsley o • Curled dock o • Creeping thistle o	Poor	No	
f2d: Aquatic marginal vegetation	C9	Across the survey area, on the banks of the river, is a strip of aquatic marginal vegetation. This is dominated by common reed and frequently transitions on to mixed scrub, bramble scrub, ruderal vegetation or taller sward grassland, forming an ecotone. This habitat is not wide enough to be mapped as reedbeds and as such is mapped as aquatic marginal vegetation. Species include: • Common reed d • Bullrush o • Bramble f • Rosebay willowherb f • Cow parsley o • Common nettle f • Hogweed o	Not applicable (to form part of river MoRPH survey)	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1-81: Ruderal or ephemeral	C10	In the northeast corner of the survey area, on a field boundary (field compartment C12), is an area of tall ruderal vegetation, on the banks of the river. Species include: • Common nettle d • Hedge wound wort o • Cow parsley f • Cleavers o • Bramble f • Rosebay willowherb o	Moderate	No	
h2a5: Species-rich native hedgerow 11: Hedgerow with trees 50: Ditch	C11	This is a defunct hedgerow with trees on the northeastern boundary of the survey area associated with wet ditch (with the ditch falling outside of the survey area). Hedgerow shrubs are tall and mature, and the hedgerow appears unmanaged. The hedgerow is c.4m tall and 2m wide. Large vertical gaps are present between the ground and canopy layer and large horizontal gaps are present. Species include: • Bramble a • Crack willow a • Hawthorn a • Ivy a • Elder o • Ash o	Moderate	Yes	
g3c: Other neutral grassland	C12	The parcel is a grassland field. The field is partitioned by temporary electric fencing, and wooden post fencing, and horses are present within some of these partitioned areas, with grazing rotated. Sward height across the field is generally short, and grazed to ground level, however at the field boundaries and in some areas without horses, the sward reaches a greater height such that at least 20% is above 7cm in height. The grasses are forming tussocks in places and there are mole hills present. There are some localised areas of bare ground caused by vehicle activity, excessive poaching and rabbits' activity, that are likely to exceed over 5% of the grassland. Species indicative of sub-optimal condition are present and include white clover, creeping buttercup and curled dock. Average species richness across five quadrats was 8, and 6.2 when excluding species indicative of sub-optimal condition. This field is mapped as non-HPI good quality semi-improved grassland on MAGIC. Species include: • Perennial rye-grass a • White clover o • Yorkshire-fog a • Annual meadow grass o • Common bent a • Creeping buttercup f • Ribwort plantain f • Dove's-foot crane's-bill r • Daisy f • Cocks foot o • Curled dock r, • Dandelion r • Creeping cinquefoil r	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1c: Artificial unvegetated, unsealed surface	C13	This is a large area of gravel in the south of the survey area, used as a works area by Southern Water, this is to be reverted to a vegetated habitat at some point in the future according to a southern water employee.	Not applicable	No	
w1f7: Other lowland mixed deciduous woodland	C14	This is a woodland present in the southeast of the survey area. This field is mapped asHPI deciduous woodland on the Priority Habitat Inventory (England). This woodland appears to be managed as a coppice, or has been historically. The woodland is publicly accessible and appears to be frequently used for dog walking, and there was also an encampment present in the woodland. The ground flora appears to be being impacted by amenity use, with large dominated by bare ground, bramble scrub, ivy and common nettle. Owing to the winter period of the survey, tree identification was difficult. A stand of black poplar, or a black poplar hybrid is present on the northern edge of the woodland. Species include: • Hawthorn f • Elder o • Crack willow f, • Grey poplar a • Tutsan r • Bramble a, • Wood avens f • False brome o • Pendulous sedge o • Black poplar (or black poplar hybrid) o • Goat willow f • Pedunculate oak o • Common nettle f • Ash o	Moderate	Yes	
h3d: Bramble scrub	C15	To the north of the woodland is a large area of bramble dominated scrub. There appears to be some mature shrub species present within the scrub, and these could not be accessed to map separately as individual trees. Species include: • Bramble d • Goat willow o • Hawthorn o • Common nettle f • Rosebay willowherb f • Cow parsley o • Creeping thistle o	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
r1g-50: Ditch	C16	In the centre of the survey area is a wet ditch, connecting to the river/stream to the north, labelled as a drain on OS maps. The ditch is surrounded by dense vegetation, and was largely inaccessible to survey, as such, some assumptions have been made for its condition assessment. Species include: • Common reed a • Dogwood a • Bramble o • Hawthorn o • Goat willow o • Common nettle f	Moderate	No	
h3h: Mixed scrub	C17	To the west of the woodland, adjacent to the ditch is an area of dense mixed scrub dominated by dog wood. Species include: • Dogwood d • Bramble f • Crack willow o • Blackthorn f • Common nettle f	Moderate	No	
g4-27: Traditional orchard	C18	To the south of the survey area adjacent to a number of residential properties, is a small area of modified grassland with a number of scattered trees dominated by fruiting tree species. This area appears to be tended by local residents and has a number of ornamental plant species. The grassland is dominated by perennial rye grass and has a uniform short sward and appears to be mown frequently. Part of this habitat falls within an area mapped as HPI deciduous woodland. This habitat has been classified as traditional orchard, although it does not neatly fall into this habitat definition as many of the trees are non-fruiting, and the ground vegetation is managed for amenity purposes. It has been classified as traditional orchard on a precautionary basis; however, it is not mapped as HPI traditional orchard on Natural England Priority Habitat Inventory or the Peoples Trust for Endangered Species: Traditional Orchard Inventory, and this habitat is considered unlikely to be a HPI. This habitat was assessed as traditional orchard on a precautionary basis owing to time constrains during the survey and the sub-optimal time of the year the survey took place. Further survey is recommended at the optimal time of year to establish if this is a HPI habitat. Species include: • Silver birch r • Planted cherry f • Ornamental plum sp. o • Domestic apple sp. o • Perennial rye-grass d • Pendulous sedge f • Daisy o • Greater plantain o • Dandelion o	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
h3h: Mixed scrub	C19	In the southeastern corner of the survey area is an area of dense mixed scrub. Species include: • Bramble a • Dog wood a • Hawthorn f • Blackthorn f • Goat willow o	Good	No	
h3h: Mixed scrub	C20	Along the southern boundary of the survey area (compartment C21), is a long strip of mixed scrub that backs onto a row of residential properties. Only the eastern edge of the scrub could be accessed to survey, so habitat type and condition has been assumed on available survey data and aerial imagery, a precautionary approach has been taken to assess condition. Species include: • Hawthorn a • Blackthorn a • Dog wood a • Bramble a • Elder o • Goat willow f	Good	No	
55: Floodplain wetland mosaic	C21	The majority of the survey area to the south of the river is dominated by a wetland habitat, formed from a mosaic of common reed, dog wood scrub, mixed scrub and scattered blackthorn and willows. The ground is waterlogged, with many areas of standing open water. Only the southern edge of the habitat could not be accessed to survey as the dense vegetation and wet conditions prevented access, the habitat type has been informed by available survey data and aerial imagery, with a precautionary approach taken to assessing habitat condition, with this habitat categorised as floodplain wetland mosaic. This field is mapped as non-HPI good quality semi-improved grassland on MAGIC. Species include: • Common reed d • Dogwood a • Hawthorn o • Blackthorn f • Pendulous sedge	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
w1g: Other broadleaved woodland	C22	Within the centre of parcel C21 are two large areas of what appear to be late successional scrub or early successional woodland habitat. These areas could not be accessed to survey as the dense vegetation and wet conditions prevented access, and were surveyed from a distance, as such a precautionary approach has been taken to habitat categorisation and condition assessment. These habitats have been assessed as being other broadleaved woodland, they are considered likely to be an early successional willow and alder carr. Species include: • Alder f • Willow sp. f • Hawthorn f • Blackthorn f • Bramble f	Good	No	
w1f7: Other Lowland mixed deciduous woodland	C23	To the southwest of the survey area is a parcel of woodland, that is backed onto by a number of residential properties. This area could not be accessed to survey as the dense vegetation and wet conditions prevented access. As such, a precautionary approach has been taken to the habitat categorisation and condition assessment and has been informed by available aerial imagery. This field is mapped as HPI deciduous woodland on the Priority Habitat Inventory (England).	Good	Yes	No photo available
h3h: Mixed scrub	C24	On the southern bank of the river/stream is what appears to be on aerial imagery, a strip of dense mixed scrub. This area could not be accessed to survey as the dense vegetation and wet conditions prevented access. As such, a precautionary approach has been taken to the habitat categorisation and condition assessment and has been informed by available aerial imagery.	Good	No	No photo available
u1b6: Other developed land	C25	In the northwest of the survey area, at the access point to the northwestern field, is an area of recently cleared vegetation, bare earth and rubble.	Not applicable	No	
w1f7: Other Lowland mixed deciduous woodland	C26	In the northwest of the survey area, to the south of Old Salts Farm Road is a small parcel of woodland. The woodland is dominated by hawthorn, with some elder, blackthorn and pedunculate oak. The ground flora is chocked with bramble scrub. Trees are all of a similar age class, with a few younger trees present. This area has not been identified as a HPI on MAGIC. Species include: • Hawthorn a • Elder f • Pedunculate oak o • Bramble a • Ivy a • Hops o • Common nettle f • Blackthorn o	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1b5: Buildings	C27	Across the survey area are a number of buildings including sheds and stables.	Not applicable	No	
w1-33: Line of trees	C28	In the northwestern field along its eastern boundary, is a line of heavily pollarded willow trees. Species include: • Willow sp. d	Poor	No	
h3d: Bramble scrub	C29	In the north-western field (compartment C30), on its northern boundary is an area of dense bramble scrub. Species include: • Bramble d	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
g3c-19: Coastal floodplain and grazing marsh	C30	The northwestern field is dominated by a grassland habitat. This field was likely historically grazed by horses, however, it appears that grazing hasn't taken place for a number of years. The grassland was waterlogged during the survey, with some areas of standing open water and there are species indicative of permanently wet conditions including common reed and wavy hair grass. Sward height was tall and varied ranging from 6-3cm, and dense tussocks are present. There were some small, localised areas of bare ground totalling around 1% of the grassland. Species indicative if sub-optimal condition are present and include bramble, creeping buttercup and creeping thistle. Species richness across five quadrats was 7.8, and 5.6 when excluding species indicative of sub-optimal condition. This field is mapped asHPI coastal and floodplain grazing marsh the Priority Habitat Inventory (England). Species include: • Perennial rye-grass o • White clover o • Common reed f • Yorkshire-fog a • Common bent a • Creeping thistle o • Cock's-foot o • Curled dock • Annual meadow grass o • Wavy hair-grass d • Creeping buttercup o • Cow parsley r • False oat-grass o • Bedstraw sp. r • Bramble o • Ragwort o • Meadow foxtail o	Moderate	Yes	
NE0016: Rural tree	TC1-TC30	1. One small hawthorn 2. Two small elder 3. Two small elder 4. Two small elder 5. One small elder. 6. One small elder. 7. One small elder. 8. One small elder. 9. One small elder. 10. One small blackthorn. 11. One small goat willow. 12. TC11, small elder and TC12 small elder. 13. One small elder. 14. One small hawthorn. 15. One small ash. 16. One small ash. 17. One medium willow sp. 18. One medium alder. 19. Three small alders. 20. One small hawthorn. 21. One small elder. 22. Two small alder. 23. Two small alder 24. One small blackthorn. 25. One small blackthorn. 26. Two small alder one medium alder. 27. Three small alders 28. Two small alders. 29. One small hawthorn. 30. Oen small hawthorn.	Multiple	No	

Target Note	Description	Photograph
TN1	Remains of fox	
TN2	Remains of barn owl.	
TN3	Mammal trail into river.	
TN4	Fly tipping in woodland.	

Target Note	Description	Photograph
TN5	Large mammal hole in woodland	

Table 27: Site D, Land North of Hill Farm Way habitat survey results

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
g4: Modified grassland	D1	This parcel is an area of modified grassland that is present across site. Some areas are sub portioned with temporary fencing and are grazed by horses. The grassland is uniform across the site with a very short sward at ground level, with a similar species composition across the grassland (the grassland does have a longer sward at the field boundaries, however this is at less than 20% of the total grassland area). Bramble scrub and ruderal vegetation is present on the boundaries, and these are mapped separately where it is extensive. There are many areas of background across the grassland caused by vehicle access, trampling by horses and other damaging activities. Species of sub-optimal condition are present and include ragwort, bramble and creeping buttercup. Average species richness across three quadrats was 8.33, and 6.0 when excluding species indicative of sub-optimal condition. Species include: • Perennial rye-grass a • White clover a • Cock's-foot f • Yorkshire-fog f • Yarrow o • Ribwort plantain o • Daisy o • Dandelion o • Dove's-foot crane's-bill o • Fescue sp. o • Ragwort o • Creeping buttercup o • Bramble o • Moss sp. a	Moderate	No	
h3d: Bramble scrub	D2	There are patches of bramble scrub across the survey area, located on the survey area boundaries, and in a few discreet patches in the horse field to the north. Species include: • Bramble d • Rosebay willowherb f • Cocks foot o • Ragwort o • Common nettle f • Cow parsley f	Poor	No	
u1- 81: Ruderal or ephemeral	D3	In the northeast of the survey area is an area of ruderal vegetation that has formed on a manure pile, adjacent to a patch of bramble scrub. Species include: • Common nettle D • Spear thistle r • Creeping thistle f • Curled dock o • Cow parsley o • Bramble f • Black horehound o	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1b5: Buildings	D4	Across the survey area are four buildings used as storage and as stables.	Not applicable	No	
u1b: Developed land; sealed surface	D5	Across the survey area are areas of concrete hardstanding.	Not applicable	No	
u1- 847: Introduced shrub	D6	Along a brick boundary wall in in the north of the survey area a line of mature butterfly-bush shrubs are growing. Species include: • Butterfly-bush d • Bramble f • Common nettle f, • Cow parsley o • Curled dock o	Not applicable	No	
u1c: Artificial unvegetated, unsealed surface	D7	At the western entrance of the survey area a track is present for vehicle access consisting of compacted earth and gravel.	Not applicable	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1b6: Other developed land	D8	Across the survey is other developed land, with permanent caravans, grain silos and other built structure.	Not applicable	No	
u1- 829: Unvegetated garden	D9	In the southern part of the survey area is a private unvegetated garden enclosed by a brick wall.	Not applicable	No	
NE0014: Urban tree	TD1	1. One small elder with dense ivy cover	Good	No	

Target Note	Description	Photograph
TN1	Manure pile	

Table 28: Site E, Shoreham Gateway habitat survey results

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
g4: Modified grassland 19: Coastal and floodplain and grazing marsh	E1	This habitat parcel consists of a large, modified grassland field. It is grazed with horses, which were present at the time of the survey. The grassland is split into two interconnected sections by a fenced-off bund. The grassland floods seasonally and was wet during the survey, with some large areas of standing water in puddles. The grasslands have a lot of damage from trampling and poaching, with a large area of mud present in the southern section. Sward height was very low and uniform, being grazed to ground height. Average species richness across three quadrats was 5.3, and 4.7 when excluding species indicative of sub-optimal condition. This habitat parcel is mapped as being HPI coastal and floodplain grazing marsh on MAGIC, and has been assessed as such. Species include: • Perennial rye-grass a • White clover a • Cock's-foot f • Yorkshire-fog f • Yarrow o • Ribwort plantain o • Daisy o • Dandelion o • Dove's-foot crane's-bill o • Fescue sp. o • Ragwort o • Creeping buttercup o • Bramble o • Moss sp. a	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
g2c: Other calcareous grasslands 19: Coastal and floodplain and grazing marsh	E2	This parcel is an area of grassland on a fenced-off bund in the centre of the site. There is some scattered gorse present and scattered bramble and species indicative of sub-optimal condition including common nettle, creeping thistle and curled dock. The sward heigh is varied and ranges from knee height to ground level, with grasses forming tussocks in places. Average species richness across five quadrats was 11.4, and 9.8 when excluding species indicative of sub-optimal condition. The soils locally are rich in lime and chalk, and it is likely the bund is constructed with chalk rich earth, and there are species indicative of calcareous grassland including Shepards needle, ox-eye daisy, birds foot trefoil and gorse, as such this habitat has been assessed as other calcareous grassland. This habitat parcel is mapped as being HPI coastal and floodplain grazing marsh on MAGIC, and has been assessed as such. Species include: • Fescue sp. a • Yorkshire-fog a • Ox-eye daisy a • White clover o • Creeping cinquefoil o • Yarrow o • Bramble o • Bristly oxtongue r • Common bird's-foot trefoil o • Shepherds needle o • Cock's-foot f • Spear thistle o • Yarrow f • Dove's-foot crane's-bill o • Cat's-ear sp. r • Creeping cinquefoil o • Meadow foxtail o • Ragwort r • Dandelion o • Willowherb sp. r • Early forget-me-not o • Gorse o • Ox-eye daisy o • Hemlock r • Curled dock o • Common nettle o	Moderate	Yes	
h3d: Bramble scrub	E3	Across the survey area, growing on the survey area boundaries are discreet areas of dense bramble scrub. This habitat parcel is mapped as being HPI coastal and floodplain grazing marsh on MAGIC. Species include: • Bramble d	Poor	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
h2a5: Species-rich native hedgerow 11 - Hedgerow with trees 50 - Ditch	E4	On the western boundary of the survey area is a native species-rich hedgerow with trees, associated with a wet ditch. The hedgerow falls on the western bank of the ditch, with the ditch likely to delineate the boundary of the survey area, so the trunk base of this hedgerow may fall just outside of the survey area, with shrub areas and canopy falling within it. There is a break in the hedgerow where the bund is present. Species include: • Goat willow f • Elder f • Bramble A • Dog rose o • Dogwood f • Ivy f • Hawthorn o • Ash o • Sycamore o	Moderate	Yes	
r1g – 50: Ditch	E5	On the western boundary of the survey area, associated with hedgerow E4 is a wet ditch. This ditch is c.2m wide, and at least 1m deep. Much of the ditch is heavily shaded by the hedgerow, and bramble scrub and is not visible. The stretches which were accessible had a clear water quality with low turbidity. No aquatic floating, emergent or marginal was observed. The banks of the ditch are damaged by horse activity. This habitat parcel is mapped as being HPI coastal and floodplain grazing marsh on MAGIC.	Poor	Yes	
u1b5: Buildings	E6	Across the survey area are a number of built structures including sheds and stables.	Not applicable	No	
u1b6: Other developed land	E7	In the south of the survey area, at the entrance to the fields is an area of bare ground and wood chippings, areas of gravel and hardstanding, there are also caravans and storage units.	Not applicable	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
h3h: Mixed scrub	E8	In the southern part of the survey area along the survey area boundaries is an area of mixed scrub. The scrub is dominated by bramble, with some elder and hawthorn. This habitat parcel is mapped as being HPI coastal and floodplain grazing marsh on MAGIC/ Species include: • Bramble d • Elder o • Hawthorn o • Ivy f • Common nettle a • Creeping thistle o • Cow parsley o	Moderate	Yes	
NE0016: Rural tree	GE1-TE4	1. Four small elder 2. Small elder on survey area boundary. 3. Small elder 4. Small elder	Moderate	No	

Target Note	Description	Photograph
TN1	Pile of building materials	
TN2	Pile of garden waste	

Table 29: Site F, Land at Upton Farm

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
g4: Modified grassland	F1	This habitat parcel is a horse grazed grassland that is in the western part of the field, with the field divided into two parcels by an electric fence, with horses present in the western part at the time of the survey. The grassland has a short uniform sward grazed to ground level. There were many areas of bare ground from trampling by horses and excessive poaching. There were some discrete patches of bramble scrub present, that owing to their extent, have been mapped separately. Many species indicative of sub-optimal condition are present, including creeping buttercup, ragwort, common nettle and curled dock. Average species richness across three quadrats was 6, and 3.3 when excluding species indicative of sub-optimal condition. Species include: • Perennial rye-grass a • Yorkshire-fog f • White clover f • Ragwort o • Yarrow o • Daisy o • Creeping buttercup o, • Dandelion f • Common mouse-ear o • Common nettle o • Curled dock o • Bramble o	Moderate	No	
g4: Modified grassland	F2	This habitat parcel is in the eastern half of the field, separated by an electric fence. This parcel is likely to be periodically hors grazed although there were no horses were present at the time of the survey. The grassland had a varied sward height with at least 20% over 7cm but with the majority 4-6cm, the grassland is forming tussocks in places. Rabbits are present, and there were some small areas of localised bare ground caused by burrowing/browsing. Species indicative of sub-optimal condition were present and include ragwort, common nettle, creeping thistle and curled dock. Average species richness across three quadrats was 7.7, and 4.3 when excluding species indicative of sub-optimal condition. Species include: • Perennial rye-grass a • Common bent f • Yorkshire-fog o • Creeping buttercup o • Annual meadow grass r • Curled dock o • Common nettle r • Dandelion r • Creeping thistle r • Ribwort plantain r • Ragwort o • Spear thistle o • Bristly oxtongue o	Good	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
h3d: Bramble scrub	F3	Across the survey area, growing on the survey area boundaries are discreet areas of dense bramble scrub. Species include: • Bramble d • Elder r • Ragwort o • Cow parsley o • Common nettle f • Creeping thistle o	Not applicable	No	
h2a5: Species-rich native hedgerow	F4	On the northern boundary of the survey area is a native species-rich hedgerow, which is to the south of the Upper Brighton Road dual carriageway. The hedgerow has a tall and unmanaged structure with tall spreading tops that are dying back in some shrubs, and there were large gaps between the ground and canopy layer. There are a number of large horizontal gaps, one of which exceeds five meters. The hedgerow is full of litter from passing motorists. Species indicative of enrichment are present and include bramble, common nettle, curled dock and creeping thistle. Species include: • Bramble a • Ivy a • Hawthorn a • Blackthorn f • Dog rose o • Elder o • Elm r • Holly r • Hazel r	Poor	Yes	
u1b5: Buildings	F5	To the west of the survey area at the entrance to the field is a number of built structures including sheds and stables.	Not applicable	No	
NE0016: Rural tree	GF1 – TF7	1. Three small elder 2. One medium elder with dense ivy cover. 3. Small elder on edge of parcel of bramble scrub. 4. Small elder 5. Two small elm. 6. Two small hawthorn. 7. One medium elder in dense bramble scrub.	Moderate	No	

Table 30: Site G, Land East of Manor Close

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1c: Artificial unvegetated, unsealed surface	G1	In the southwest of the survey area is a large area of compacted earth and gravel.	Not applicable	No	
u1b5: Buildings	G2	In the southwest of the survey area are a number of buildings and sheds, in the north of the survey area is a very dilapidated structure.	Not applicable	No	
h3d: Bramble scrub	G3	Across the survey area, growing on the survey area boundaries are discreet areas of dense bramble scrub. These parcels of bramble scrub fall within areas mapped as HPI coastal and floodplain grazing marsh on the Priority Habitat Inventory (England) on MAGIC. Species include: • Bramble d • Common nettle f • Creeping thistle o • Cow parsley o	Poor	Yes	
h3h: Mixed scrub	G4	This is an area of mixed scrub on the western boundary of the survey area adjacent to a wet ditch and a residential property. The scrub is dominated by bramble with some hawthorn and elder. This parcel falls within an area mapped as HPI coastal and floodplain grazing marsh on the Priority Habitat Inventory (England) on MAGIC. Species include: • Bramble d • Hawthorn o • Elder r • Rosebay willowherb o • Cow parsley o • Common nettle f	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1-510: Bare ground	G5	Two parcels of bare ground in the southeast of the survey area. To the west is a dirt track used for vehicle access. To the east (pictured) is an area of turned/disturbed earth that has very low densities of ephemeral species starting to colonise. This parcel falls within an area mapped as HPI coastal and floodplain grazing marsh on the Priority Habitat Inventory (England) on MAGIC. Species include: • Bristly oxtongue o • Cock's-foot o • Bramble o • Petty spurge o • Common nettle o	Poor	Yes	
h3h: Mixed scrub	G6	This parcel is an area of mixed scrub in the southeast of the survey area on the field boundary and adjacent to a wet ditch. The scrub is dominated by bramble with some hawthorn, blackthorn and elder. This parcel falls within an area mapped as HPI coastal and floodplain grazing marsh on the Priority Habitat Inventory (England) on MAGIC. Species include: • Bramble d • Hawthorn o • Elder r • Blackthorn o • Cow parsley o • Curled dock o • Common nettle f • Rosebay willowherb o • Creeping thistle o	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
g3c: Other neutral grassland 19: Coastal and floodplain and grazing marsh	G7	This parcel is a large grassland field in the centre of the survey area. It is divided into a northern and southern section by a ditch. It does not appear to be grazed but is usually mown annually. There is a section in the southern section which is fenced with temporary fencing and is used for dog training, this area is mown more frequently and has a shorter sward height. Sward height is tall and varied ranging from 10-45 cm, with tussocks forming. there are some discrete patches of bramble scrub on the boundaries, with ruderal vegetation present on the ditch banks. There are some localised areas of bare ground. During the survey a lot of invertebrate activity was observed with an abundance of spiders seen. Species indicative of sub-optimal condition are present and include creeping buttercup, bramble, curled dock and common nettle. Average species richness across five quadrats was 6.8, and 5.2 when excluding species of sub-optimal condition. This habitat is mapped as HPI coastal and floodplain grazing marsh on the Priority Habitat Inventory (England) on MAGIC, and the habitat has been assessed as such. The ditches on site had clear water with low turbidity and good water quality, but only one of the four ditches present had good condition. Species include: • Perennial rye-grass a • White clover f • Yorkshire-fog d • Common bent a • Ribwort plantain f • Cock's-foot o • Annual meadow grass o • Common bird's-foot trefoil r • Creeping thistle r • Ribwort plantain • Meadow foxtail o, • Cow parsley o • Curled dock o • Common nettle o • Bramble r • Creping buttercup o • Meadow Cranesbill o	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
r1g-50: Ditch	G8	Across the survey area is a system of interconnected wet ditches. Ditch G8 goes from west to east across the centre of the survey area. The ditch has a track that runs over its middle, and the ditch appears to be dammed or culverted, with the water level higher in the western stretch than it is in the eastern stretch. The ditch is at least 1m deep and around 1.5m wide. The ditch permanently holds water. Stickleback and moorhen were seen. Duckweed is present but at less than 10%. A strip of marginal vegetation was present and some submerged and emergent species also. The ditch runs adjacent to scattered trees and the area of woodland, however these are present on its northern bank and less than 10% of the ditch is heavily shaded. The ditch had clear water with low turbidity and good water quality. This habitat falls within areas mapped as HPI coastal and floodplain grazing marsh as well as deciduous woodland on the Priority Habitat Inventory (England) on MAGIC. Species include: • Common duckweed o • Pendulous sedge a • Common reed o • Bullrush o • Rosebay willowherb f • Hogweed o • Common nettle o • Bramble o • Watercress f	Good	Yes	
r1g-50: Ditch	G9	Ditch G9 is present on the western boundary of the survey area, it is culverted to the south and runs adjacent to residential properties. The ditch has dense mixed scrub on its bank which shades more than 10% of the ditch. The ditch is at least 1m deep and around 1.5m wide and permanently holds water. Stickleback and moorhen were seen in the ditch and there were anecdotal reports from a local resident of smooth newt being present. A strip of marginal vegetation was present and some submerged and emergent species also. The ditch is dammed at the western end of the woodland, and access track is present. This habitat falls within an area mapped as HPI coastal and floodplain grazing marsh on the Priority Habitat Inventory (England) on MAGIC. Species include: • Common duckweed o • Bullrush o • Bramble o • Rosebay willowherb f • Watercress f • Cow parsley • Hogweed o • Common nettle o • Pendulous sedge a • Common reed o	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1-81: Ruderal or ephemeral	G10	This is a parcel of ruderal vegetation formed on the western woodland edge. It is formed on embankment of loose soil. There are many mammal holes present in this area. This habitat falls within an area mapped as HPI deciduous woodland on the Priority Habitat Inventory (England) on MAGIC. Species include: • Common nettle d • Lords-and-ladies o • Cow parsley o • Cock's-foot o • Stinking iris r • Hedge woundwort o • Rosebay willowherb f • Curled dock o	Good	Yes	
w1f7: Other Lowland mixed deciduous woodland	G11	This is a parcel of woodland formed on thin strip of land with streams/ditches to the north, south and east. In the west the woodland the canopy is very open, and the only mature trees present are large Monterey cypress and the woodland is dominated by dominated by bramble scrub, elder and hawthorn shrubs. To the east the woodland is very dense and there are a number of mature ash, crack willow and hawthorn, and there is a thick shrub layer of hawthorn, blackthorn and bramble. Throughout the woodland has a thick shrub layer, making access difficult, and much of the woodland was surveyed from it's perimeters. There are a number of standing dead trees. A fox and buzzard were seen in the woodland, and a number of mammal holes. There are anecdotal reports of a badger in the woodland. This habitat is mapped as HPI deciduous woodland on the Priority Habitat Inventory (England) on MAGIC. Species include: • Monterey cypress f • Ash f • Hawthorn a • Blackthorn f • Crack willow o • Elder a • Bramble d • Ivy f • Lords-and-ladies f • Indian cluster berry r • Common nettle a • Cow parsley o • Pendulous sedge o • Stinking iris o	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1-81: Ruderal or ephemeral	G12	The northern area of the survey area has no public access, with un-managed successional habitats dominating. A large area of this area has tall ruderal vegetation. The habitats to the north of the ditch are mapped as HPI deciduous woodland on the Priority Habitat Inventory (England), however no woodland is present in this area. Historical mapping on Google Earth (Google Earth, Accessed 19/02/2025) indicates that scattered woodland was present in 2007, and that this woodland was likely cleared between 2007 and 2011. As the woodland was cleared prior to 2020, the habitat is categorised as it is presently but assessed as high strategic significance to reflect it being mapped as priority deciduous woodland. Species include: • Teasel a • Rosebay willowherb a • Bristly oxtongue a • Creeping buttercup f • Bramble a • Creeping thistle a • Curled dock a • Butterfly-bush o	Good	Yes	
h3d: Bramble scrub	G13	The are area to the north of the ditch is dominated by dense bramble scrub. The habitats to the north of the ditch are mapped as HPI deciduous woodland on the Priority Habitat Inventory (England), however no woodland is present in this area. Historical mapping on Google Earth (Google Earth, Accessed 19/02/2025) indicates that scattered woodland was present in 2007, and that this woodland was likely cleared between 2007 and 2011. As the woodland was cleared prior to 2020, the habitat is categorised as it is presently but assessed as high strategic significance to reflect it being mapped as priority deciduous woodland. Species include: • Bramble d • Teasel f • Rosebay willowherb f • Butterfly-bush r • Dogwood r • Ash r • Common nettle f • Pendulous sedge o	Poor	Yes	
u1-847: Introduced shrub	G14	In the north of the survey area, to the south of the residential properties is a dense stand of bamboo, which is a non-native invasive. The habitats to the north of the ditch are mapped as HPI deciduous woodland on the Priority Habitat Inventory (England), however no woodland is present in this area. Historical mapping on Google Earth (Google Earth, Accessed 19/02/2025) indicates that scattered woodland was present in 2007, and that this woodland was likely cleared between 2007 and 2011. As the woodland was cleared prior to 2020, the habitat is categorised as it is presently but assessed as high strategic significance to reflect it being mapped as priority deciduous woodland. Species include: • Bamboo d	Not applicable	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1-81: Ruderal or ephemeral	G15	To the north of the survey area is a dirt access track which has a high density of ephemeral vegetation present. The habitats to the north of the ditch are mapped as HPI deciduous woodland on the Priority Habitat Inventory (England), however no woodland is present in this area. Historical mapping on Google Earth (Google Earth, Accessed 19/02/2025) indicates that scattered woodland was present in 2007, and that this woodland was likely cleared between 2007 and 2011. As the woodland was cleared prior to 2020, the habitat is categorised as it is presently, but assessed as high strategic significance to reflect it being mapped as priority deciduous woodland. Species include: • Bristly oxtongue d • Dandelion f • Bramble f • Petty spurge r • Common nettle o • Rosebay willowherb o	Poor	Yes	
w1-33: Line of trees	G16	On the eastern boundary of the survey area, adjacent to wet ditch G17 is a line of trees dominated by willow species. This habitat falls within an area mapped as HPI deciduous woodland on the Priority Habitat Inventory (England) on MAGIC. Species include: • White willow a • Crack willow f • Hawthorn o • Bramble a	Moderate	Yes	
r1g-50: Ditch	G17	This is a ditch that is present on the eastern boundary of the survey area, going from north to south, in the middle of the ditch, there is a culvert just outside the survey area boundary, and the ditch runs under the road eastward. (N to S). The ditch is deep and wide around 1m deep and 2m wide and permanently holds water. The ditch is heavily shaded by the line of trees, woodland and bramble scrub. There is some limited emergent, submerged and marginal vegetation. This habitat falls within areas mapped as HPI coastal and floodplain grazing marsh as well as deciduous woodland on the Priority Habitat Inventory (England) on MAGIC. Species include: • White willow a • Crack willow f • Pendulous sedge a • Duck weed o • Rosebay willowherb o	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
u1-828: Vegetated garden	G18	To the north of the survey area is a residential property with a garden vegetated with grassland, and ornamental planting.	Not applicable	No	
r1g-50: Ditch	G19	This ditch runs from east to west, and is present behind a row of residential properties, and north of the woodland. It is permanently wet and at least 1m deep and around 2m wide. Where it runs behind the residential properties, there are abundant garden escapee species, including bamboo. The ditch is heavily shaded by bramble scrub, ruderal vegetation and the woodland, and in paces is very choked with vegetation. This habitat falls within areas mapped as HPI coastal and floodplain grazing marsh as well as deciduous woodland on the Priority Habitat Inventory (England) on MAGIC. Species include: • Common reed a • Rosebay willowherb f • Watercress o • Common nettle f • Bamboo o • Curled dock o • Common duckweed o • Cow parsley o • Pendulous sedge f • White willow a • Crack willow f	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
NE0016: Rural tree	TG1 – GG24	1. One small elder. 2. One medium elder with dense ivy cover. 3. One small elder. 4. One small elder. 5. One small elder two small hawthorn. 6. One small hawthorn. 7. One medium mature elder. 8. One small sycamore. 9. One small sycamore. 10. One small elder, one medium hawthorn, one small hawthorn. 11. Six small sycamore, one medium sycamore on eastern bank of ditch. 12. One small hawthorn. 13. One small hawthorn. 14. One small ash. 15. One medium hawthorn by ditch. 16. One medium elder with dense ivy cover. 17. Two medium hawthorns. 18. One small elder. 19. One medium elder. 20. One medium hawthorn. 21. Two medium hawthorns, one small hawthorn. 22. One small hawthorn. 23. One medium crack willow. 24. Two medium crack willows.	Moderate	No	

Target Note	Description	Photograph
TN1	In the south of the survey area are a number of large wood piles, left from tree works completed outside of the survey area.	
TN2	In the area of ruderal vegetation to the west of the woodland are a large number of mammal holes, the ones that were seen appeared to be too small for badge, however, there were anecdotal reports of badger being present in the woodland. A fox was seen in the woodland.	

Target Note	Description	Photograph
TN3	On the western edge of the woodland was a large mammal hole, the entrance was overgrown with vegetation, this hole is large enough to be used by badger.	

Appendix 4: Biodiversity net gain assessment

Methods

Biodiversity net gain is a process applied to a project that aims to deliver a net positive change in biodiversity throughout a project lifecycle by implementing eight principles and rules (DEFRA, 2024a) (CIEEM, CIRIA, IEMA, 2019) (BSI, 2021).

To deliver a net gain in biodiversity, the following rules must be adhered to:

- Rule 1: Trading rules must be followed
- Rule 2: Biodiversity unit outputs, for each type of unit, must not be summed, traded or converted between types and at least 10% gain applies to each type of unit (e.g. habitats, hedgerows and watercourses).
- Rule 3: To accurately calculate the gains, the statutory biodiversity metric calculation tool, or small sites biodiversity metric tool where applicable, must be used.
- Rule 4: In exceptional circumstances, deviation from the biodiversity net gain metric methodology may be permitted by the relevant planning authority.

Nine principles, detailed in the statutory guidance, underpin the biodiversity metric tool.

The Local Planning Authority must take account how a development has implemented the Biodiversity Gain Hierarchy, as set in Town and Country Planning (Development Management Procedure) (England) Order 2015 (Ministry of Housing, Communities and Local Government, 2024), which is to:

- **Avoid** impacts where possible through careful project design, and specifically to habitats that have a medium, high and very high distinctiveness
- **Minimise** impacts where these cannot be avoided, prioritising the minimisation in order of distinctiveness
- **Restore** habitats that are retained or could be impacted by the project
- As a last resort, **compensate** for the loss or damage of habitats through habitat creation primarily within the red line boundary, and if this is not possible, offsite compensation can be considered. Where offsite offsets are considered, these should be as close as possible to the impact site.

The biodiversity net gain assessment was undertaken in line with the statutory metric (DEFRA, 2024a).

Baseline biodiversity units

Calculating baseline biodiversity units requires information on a habitat's area, distinctiveness, condition, and strategic significance. The habitat areas and habitat condition are based on the habitat survey methods detailed above.

Distinctiveness refers to the relative scarcity of the habitat and its importance for nature conservation. The distinctiveness categories are pre-determined by the metric.

Strategic significance is assessed against information in the local plan or policies for that habitat and its location. This is considered separately for each habitat type. Appendix 2 details the results of the desk study that informed the assessment of Strategic Significance for each site and habitat type. No LNRS has been published for Adur. The table below details the parameters by which strategic significance was assessed; this is in accordance with the Statutory Biodiversity Metric.

Table 31: Parameters for assessing strategic significance

Strategic Significance	Reason for designation
High (Formally identified in local strategy)	Any habitats mapped as a HPI on Natural England's Priority Habitat Inventory. Habitats listed in Sussex' BAP Any habitats that fall within the boundaries of designated sites (including BOAs) Habitats referenced in Adur's Local Plan 2017 (including trees)
Medium (Location ecologically desirable but not in local strategy)	Any habitats present that did not meet the requirements listed above, but met the following criteria: • Provide a valuable ecological resource for a range of fauna species; and • Provide connectivity to the wider landscape; and • Provide a valuable ecological resource in an area where this is lacking.
Low (Area/compensation not in local strategy/ no local strategy)	Assigned to any habitats that did not meet the criteria listed above.

The table below gives the dates that data were inputted into each of the statutory biodiversity net gain metrics. The completed metrics accompanies this report

Table 32: Dates of metric completion

Site Reference	Baseline (V1)	Model 1 (V1.1)	Model 2 (V1.2)	Model 3 (V1.3)
Site A	13/02/2025	17/02/2025	18/02/2025	18/02/2025
Site B	13/02/2025	17/02/2025	18/02/2025	18/02/2025
Site C	14/02/2025	24/02/2025	24/02/2025	24/02/2025
Site D	14/02/2025	17/02/2025	18/02/2025	18/02/2025
Site E	13/02/2025	17/02/2025	19/02/2025	19/02/2025
Site F	13/02/2025	17/02/2025	19/02/2025	19/02/2025
Site G	14/02/2025	19/02/2025	24/02/2025	24/02/2025
Site H	26/02/2025	27/02/2025	27/02/2025	27/02/2025

The baseline units were calculated for:

- Habitats
- Hedgerows
- Watercourses (ditches only)

In line with the National Planning Policy Framework (2024) (Ministry of Housing, Communities and Local Government, 2024), irreplaceable habitats are those that would be technically very difficult to restore, recreate or replace once destroyed Examples include ancient woodland, ancient and veteran trees and lowland fen. These, and very high distinctiveness habitats, are treated separately within the biodiversity net gain metric and the relevant section was completed in line with guidance (DEFRA, 2024a).

Condition for each habitat was assessed in line with the condition assessment sheets (DEFRA, 2024b). Completed assessment sheets accompany this report.

Individual trees

Individual trees can either be classed as urban, where they are bounded or near hard standing, or rural trees for all other tree types. They are assessed as being small; medium; large; or very large

Tree size was based on the following parameters:

- Small: diameter at breast height > 7.5cm - ≤ 30cm
- Medium: diameter at breast height >30cm - ≤ 60cm
- Large: diameter at breast height > 60cm - ≤ 90cm
- Very large: diameter at breast height > 90 cm

Trees within a hedgerow, traditional orchard, wood-pasture and parkland, were recorded as individual trees when they were medium or larger.

Hedgerows

Standard methodology was used to assess hedgerows. Where double hedgerows were observed, these were recorded as two hedgerows (DEFRA, 2024a) (DEFRA, 2024b).

Watercourses (ditches)

Standard methodology was used to assess ditches. The assessment was completed on the riparian zone (5m from the top of each bank for ditches) (DEFRA, 2024a) (DEFRA, 2024b).

Post-development Modelling

To compare different post-development scenarios on the BNG outputs for each site, three post-development models were inputted into the metric for each site.

The three post-development models are based on advice given in the Statutory Biodiversity Metric User Guide (DEFRA, 2024a) which states:

> *"Where detailed plans are not available, you should use a default 70:30 ratio of* 'urban – developed land; sealed surface' *to* 'urban – vegetated garden' *when assessing habitats within areas outlined for housing."*

The three models are variations on this advice, with differing outcomes in terms of the number of BNG units delivered. See table 17 below.

In this assessment cover of other neutral grassland and mixed scrub was also included in the models, owing to the frequency this habitat was present within the baselines; as they routinely appear in the development designs SWT Ecology Services works on; as these habitats are relatively straightforward to establish and manage; and as design plans are often more diverse than only built areas and vegetated gardens.

The cover of each post-development habitat for each model was calculated as a percentage of the total site area (excluding individual trees, in accordance with the metric). For each of the models, it was assumed that all individual trees, hedgerows, line of trees and ditches/watercourses, would be retained with no change in condition. Strategic significance for all post development habitats was assessed as being low, to reflect the loss of all existing habitats on site.

The three final post-development design models are presented in the table below.

Please note that this approach is indicative only and is a worst-case scenario, as no consideration has been given to avoid the impacts on the highest value habitats, as site layout as not been considered on a site-specific level.

Table 33: BNG Post-development Models

Model	Habitat	Condition	Percent cover of total site area
Model 1	Developed land; sealed surface	N/A	70%
	Vegetated garden	N/A	25%
	Mixed scrub	Good	2.50%
	Other neutral grassland	Good	2.50%
Model 2	Developed land; sealed surface	N/A	80%
	Vegetated garden	N/A	15%
	Mixed scrub	Good	2.50%
	Other neutral grassland	Good	2.50%
Model 3	Developed land; sealed surface	N/A	60%
	Vegetated garden	N/A	25%
	Mixed scrub	Good	7.50%
	Other neutral grassland	Good	7.50%

The three post-development models were run for each site, with both a BNG target of 10% and 20%, with the required unit shortfall (the number of units required to reach the target BNG) recorded under both targets, for each model for every site.

Compensation

To meet biodiversity net gain objectives, compensation must be either delivered within the site boundary (onsite) or outside the site boundary (offsite). A spatial risk factor is determined based on where the proposed compensation will be delivered, encouraging the delivery of compensation as close as possible to the site boundary.

- Spatial risk score of 1: Whether the compensation is inside the Local Planning Authority boundary or National Character Area. For watercourses this is within the waterbody catchment.
- Spatial risk score of 0.75: Whether the compensation is within a neighbouring Local Planning Authority boundary or Natural Character Area. For watercourses, this is outside the waterbody catchment but within the operational catchment.
- Spatial risk score of 0.5: Does not comply with the two situations above.

Securing offsite offsets

Where biodiversity net gain cannot be delivered within the site boundary, an offsite compensation must be secured. This must be sourced from DEFRA's offsite register and all biodiversity net gain units must be legally secured for 30 years.

Assessment of predicted costs

The results of the BNG assessment and modelling were used to calculate the predicted cost (using BNG offsetting) of reaching a 10% and 20% BNG for each site. These costs were calculated based on the total unit shortfall for each site under a 10% and 20% BNG target. The predicted costs were calculated for area habitats only and not for any linear habitats (hedgerows, line of trees, ditches).

The predicted costs were calculated for each site, and to take into account trading rules around replacing like for like with higher distinctive ness habitats, were calculated based on the baseline habitats present in each site.

The cost of offsetting habitats was based on Biodiversity Units UK Pricing Report analyses data from 46 BNG habitat banks across England (Biodiversity Units UK and Arbtec, 2024). The costs for the listed habitat types are given in the table below.

Table 34: Biodiversity Units UK habitat price per unit

BNG Pricing South		
Habitat type	**Distinctiveness**	**Price per unit**
Other neutral grassland	Medium	£27,200.00
Woodland and forest	Medium	£32,800.00
Heathland and scrub	Medium	£31,500.00
Lakes/Ponds	Medium	£65,625.00
Lowland Meadow	Very high	£41,375.00
Watercourses	High	£164,575.00
Individual trees	Medium	£35,200.00
Woodland and forest	High	£49,300.00
Traditional Orchard	High	£42,700.00
Wet woodland	Medium	£40,825.00
Mixed deciduous woodland	High	£57,125.00

Some of the habitats present in the baseline of the sites were not listed in Biodiversity Units UK, and for these habitats some assumptions were made on the approximate costs. These are as follows:

- Modified grassland; Ruderal/Ephemeral; Tall forbs; and Other lowland acid grassland were costed at the same price as Other Neutral Grassland.
- Floodplain wetland mosaic and Coastal and floodplain grazing marsh were costed based on prices given on Government guidance on statutory biodiversity credit prices (GOV.UK, Accessed on 04/03/2025), which costs this habitat at £250,000 per unit. To reflect the fact that these costs are artificially inflated to deter their use, the costs inputted into the metric were half of this as £125,000 per unit, to reflect actual market costs.

In order to calculate the approximate cost of reaching a 10% and 20% gain through offsite offsetting, inferred from baseline habitats, the following calculations were made:

1. The percent contribution of each baseline habitat to the final baseline BNG (calculated as: baseline habitat unit value ÷ total baseline habitat units x 100).
2. The required number of additional units from each baseline habitat to reach a 10 and 20% net gain (calculated as: total units required to reach 10 or 20% BNG ÷ 100 x percent contribution of each baseline habitat to the final baseline BNG).
3. The approximate cost of buying the required number of additional units for each baseline habitat (calculated as: required number of additional units from each baseline habitat to reach a 10 and 20% net gain x approximate cost of each habitat type).
4. The total cost of offsetting to reach a 10% and 20% BNG for each site, could then be calculated as a total of the cost per habitat.

Limitations

The survey was not undertaken in optimal conditions, however as detailed in Appendix 3, a precautionary approach has been adopted.

Results

Full BNG assessment results for all models, are detailed in the separate biodiversity net gain metrics that accompanies this report, and the separate MASTER BNG modelling results document.

Habitat condition assessment forms are provided as a separate document which should be read in conjunction with this report.

Table 35: Vascular plant species recorded during the survey

Scientific name	Common name	Site Reference	Status	Other Notations
Acer pseudoplatanus	Sycamore	E,		
Achillea millefolium	Yarrow	B,C,D,E,F,		
Agrostis capillaris	Common Bent	C,F,G,		
Alnus glutinosa	Alder	C,		
Alopecurus pratensis	Meadow Foxtail	C,E,G,		
Anthriscus sylvestris	Cow Parsley	A, B,C,D,F,G,		
Arctium minus	Lesser Burdock	C,		
Arrhenatherum elatius	False Oat-grass	A, B,C,		
Arum maculatum	Lords-and-Ladies	C,G,		
Avenella flexuosa	Wavy Hair-grass	C,		AX
Ballota nigra	Black Horehound	D,		
Bambusoideae	Bamboo sp.	G,		
Bellis perennis	Daisy	B,C,D,E,F,		
Betula pendula	Silver Birch	C,		
Brachypodium sylvaticum	False Brome	C,		
Buddleja davidii	Butterfly-bush	A, D,G,	LISI	
Carex pendula	Pendulous Sedge	C,G,		AWI AX
Cerastium fontanum	Common Mouse-ear	B,C,F,		
Chamaecyparis lawsoniana	Lawson's Cypress	B,C,		
Chamaenerion angustifolium	Rosebay Willowherb	A, B,C,D,G,		
Cirsium arvense	Creeping Thistle	B,C,D,F,G,		
Cirsium vulgare	Spear Thistle	C,D,E,F,		
Conium maculatum	Hemlock	E,		
Convolvulus arvensis	Field Bindweed	B,		
Cornus sanguinea	Dogwood	C,E,G,		
Cortaderia selloana	Pampas grass	B,		
Corylus avellana	Hazel	F,		
Crassula helmsii	New Zealand Pigmyweed	B,	Sch9	
Crataegus monogyna	Hawthorn	B,C,E,F,G,		
Cupressus macrocarpa	Monterey cypress	G,		
Dactylis glomerata	Cock's-foot	A, B,C,D,E,G,		
Dipsacus fullonum	Wild Teasel	A, G,		
Elytrigia repens	Common Couch	A,		
Epilobium sp.	Willowherb sp.	E,		
Euphorbia peplus	Petty Spurge	G,		
Festuca sp.	Fescue sp.	A, D,E,		
Fraxinus excelsior	Ash	C,E,G,		
Galium aparine	Cleavers	C,		
Galium sp.	Bedstraw sp.	B,C,		
Geranium molle	Dove's-foot Crane's-bill	A, B,C,D,E,		
Geranium pratense	Meadow Crane's-bill	G,		GCI AX
Geranium pusillum	Small-flowered Crane's-bill	B,		
Geum urbanum	Wood Avens	C,		
Hedera helix	Ivy	A, B,C,E,F,G,		
Helminthotheca echioides	Bristly Oxtongue	A, E,F,G,		

Scientific name	Common name	Site Reference	Status	Other Notations
Heracleum sphondylium	Hogweed	C,G,		
Holcus lanatus	Yorkshire-fog	A, B,C,D,E,F,G,		
Humulus lupulus	Hop	C,		
Hypericum androsaemum	Tutsan	C,		AWI AX
Hypochaeris radicata	Cat's-ear	E,		AX
Ilex aquifolium	Holly	F,		AWI AX
Iris foetidissima	Stinking Iris	G,		AWI AX
Jacobaea vulgaris	Common Ragwort	A, B,C,D,E,F,		
Lathyrus pratensis	Meadow Vetchling	A,		GCI AX
Lemna minor	Common Duckweed	B,G,		
Leucanthemum vulgare	Oxeye Daisy	E,		GCI
Leucanthemum vulgare	Oxeye Daisy	E,		GCI
Lolium perenne	Perennial Rye-grass	B,C,D,E,F,G,		
Lonicera ligustrina	Indian Cluster Berry	G,		
Lonicera xylosteum	Fly Honeysuckle	A,		AX
Lotus corniculatus	Common Bird's-foot-trefoil	E,G,		GCI
Malus domestica	Apple	C,		
Malva sylvestris	Common Mallow	A, C,		
Muscari neglectum	Grape-hyacinth	B,		AX
Myosotis ramosissima	Early Forget-me-not	E,		GCI AX
Nasturtium officinale	Water-cress	G,		
Nymphaea sp.	White Water-lily sp.	B,		
Petasites hybridus	Butterbur	A,		GCI AX
Phormium sp.	New Zealand flax	B,		
Phragmites australis	Common Reed	C,G,		
Plantago lanceolata	Ribwort plantain	A, B,C,D,E,F,G,		
Plantago major	Greater Plantain	C,		
Poa annua	Annual Meadow-grass	C,F,G,		
Populus nigra	Black-poplar	A, C,		
Populus x canescens	Grey Poplar	C,		
Potentilla reptans	Creeping Cinquefoil	A, C,E,		
Prunus domestica	Ornamental plum sp.	C,		
Prunus sp.	Planted cherry	A, B,		
Prunus sp.	Planted cherry	C,		
Prunus sp.	Prunus sp	B,		
Prunus spinosa	Blackthorn	B,C,F,G,		
Quercus robur	Pedunculate Oak	C,		
Ranunculus repens	Creeping Buttercup	B,C,D,E,F,G,		
Ranunculus repens	Creeping Buttercup	G,		
Rosa canina	Dog-rose	A, E,F,		
Rosa sp.	Rose sp.	B,		
Rubus fruticosus agg.	Bramble	A, B,C,D,E,F,G,		
Rumex acetosa	Common Sorrel	C,		GCI AX
Rumex crispus	Curled Dock	B,C,D,E,F,G,		
Sagina sp.	Pearlwort sp.	C,		
Salix alba	White Willow	G,		
Salix caprea	Goat Willow	C,E,		

Scientific name	Common name	Site Reference	Status	Other Notations
Salix fragilis	Crack-willow	B,C,G,		
Salix sp.	Willow sp.	C,		
Sambucus nigra	Elder	B,C,D,E,F,G,		
Scandix pecten-veneris	Shepherd's-needle	E,		AX
Smyrnium olusatrum	Alexanders	A,		AX
Stachys sylvatica	Hedge Woundwort	C,G,		
Stellaria media	Common Chickweed	C,		
Taraxacum agg.	Dandelion	A, B,C,D,E,F,G,		
Torilis japonica	Upright Hedge-parsley	A,		
Trifolium repens	White Clover	B,C,D,E,F,G,		
Typha latifolia	Bulrush	C,G,		
Ulex europaeus	Gorse	E,		
Ulmus sp.	Elm sp.	F,		
Urtica dioica	Common Nettle	A, B,C,D,E,F,G,		

Table 36: Fauna species recorded during the survey

Scientific name	Common Name	Site Reference	Protection/Conservation status
Alcedo Atthis	Kingfisher	G	WCA - Sch 1 Part 1
Anas platyrhynchos	Mallard	E	Red data list/ nationally scarce/ nationally rare; BoCC - Amber
Anguis fragilis	Slow worm (anecdotal)	G	WCA - Sch 1 s9.1(killing/injuring), 9.5a; SPI
Ardea cinerea	Grey heron	C	Red data list/ nationally scarce/ nationally rare
Buteo buteo	Buzzard	E, G	
Columba palumbus	Wood pigeon	A, B, C, D, E, F	BoCC - Amber
Corvus corone	Carrion crow	A	
Cyanistes Caeruleus	Blue tit	B	
Erithacus rubecula	Robin	F, G	
Falco peregrinus	Peregrine falcon	C	WCA - Sch 1 Part 1
Fringilla coelebs	Chaffinch	D, G	
Gasterosteus aculeatus	Three spined stickleback	G	
Larus argentatus	Herring gull	A, C, E	Red data list/ nationally scarce/ nationally rare; BoCC - Red
Lissotriton vulgaris	Smooth newt (anecdotal)	G	WCA - Sch 5 s9.5a
Mareca penelope	Eurasian wigeon	C	Red data list/ nationally scarce/ nationally rare; BoCC - Amber
Meles meles	Badger (anecdotal)	G	Protection of Badgers Act 1992
Oryctolagus cuniculus	European rabbit	C, F	Red data list/ nationally scarce/ nationally rare
Parus major	Great tit	A, B, D, F	
Passer domesticus	House sparrow	A, B, C, D, E, F, G	SPI; BoCC - Red
Pica pica	Magpie	D, E, F	
Picus viridis	Green woodpecker	C	
Prunella modularis	Dunnock	C	BoCC - Amber
Rana temporaria	Common frog (anecdotal)	G	WCA - Sch 5 s9.5a
Sturnus vulgaris	Common starling	B, C, E, F, G	Red data list/ nationally scarce/ nationally rare; BoCC - Red
Troglodytes troglodytes	Wren	F, G	BoCC - Amber
Turdus merula	Black bird	F	
Tyto alba	Barn owl	C	WCA - Sch 1 Part 1
Vanellus vanellus	Northern lapwing	E	SPI; Red data list/ nationally scarce/ nationally rare; BoCC - Red
Vulpes vulpes	Fox	C, G	

Appendix 5: Development of Connectivity Analysis Methods

The GBI network and connectivity analysis was identified by developing a Circuitscape® model, which applies circuit theory to animal movement and gene flow across a resistance surface (McRae B. &., 2007) (McRae B. D., 2008). It is widely accepted as an approach to identifying suitable green and blue infrastructure corridors due to its applicability and flexibility for a wide variety of situations and parameters (Marrotte, 2017) (Strange, Panzacchi, & van Moorter, 2019) (Vincent Wildlife Trust, 2020) (Orly, 2011) (Grafius, 2017) (Koen, 2014). Circuitscape requires two inputs, a calculated resistance raster (i.e. barriers to the movement of genes) and identified core areas (i.e. where animals spend most of their time) (Strange, Panzacchi, & van Moorter, 2019). The approach conducts quantitative analysis of current GBI features using the least-cost method and identifies the relative importance of greenspace areas based on circuit theory. The model allows for the development of landscape scale maps to be produced which give a visual representation of likely valuable areas for wildlife and ecosystem services which allows priority areas for green infrastructure to be determined e.g. (Honeck, 2020) (Wang J. R., 2022).

In developing the model, a key consideration is the complexity of ecology, the dynamic nature of ecosystems and diversity of species' habitat requirements, mobility and ability to adapt to its surroundings. It would be impossible to account for all this variation within the model as corridors for some species may represent barriers for others (Bolliger, 2020). For this reason, the model is based on pragmatic and attainable data that can reduce the many dimensions of multiple species requirements to a manageable set of criteria (Wiens et al. 2008). Connectivity analysis is commonly framed around a single species, utilising autecological information such as dispersal distances and home ranges to parametrise the model. In this study, the decision was made to use a generalised terrestrial analogue species as the application was intended to create multi-purpose green corridors through Hastings, not improvements targeted to a specific species or habitat. The model was parametrised assuming that this species was limited to terrestrial movements and was unable to fly or to swim long distances. We assumed that the single species would benefit from more complex, diverse green spaces and choose to make its route through these, avoiding roads and buildings where possible.

The output provided by Circuitscape® is in a cumulative current map, which provides a cumulative view of the connectivity scenarios between core areas in pairwise comparisons. The value of each cell is determined by the number of occurrences it has in the connectivity pathways calculated in each pairwise comparison. Inferentially, this shows the overall optimal pathways but also pathways that would be less frequently used but are still valid routes through Hastings. These cumulative current maps can be reviewed qualitatively, using the values of each cell as a guidance for optimal routes, but can also be reviewed empirically with the use of the Linkage Mapper tool (discussed below). A variety of information is to be used as a contextual overlay of these maps, to enable further assessment of their viability for use in GBI plans. These additional layers would detail information such as designated sites, land in positive management and areas targeted for development.

To further refine the identification of connectivity pathways within the GBI network, the Linkage Mapper® tool was employed. Linkage Mapper is a GIS-based tool, designed to model habitat connectivity using a cost-distance approach (McRae, B.H. & Kavanagh, D.M., 2011). Linkage Mapper integrates the same resistance raster and core areas to generate movement corridors

that reflect the least energetic or easiest routes available to wildlife. Linkage Mapper provides Least-Cost Paths (LCP) and Pinch points data.

LCPs represent the most efficient routes through the landscape between core areas, taking into account movement constraints such as roads, buildings or other high-resistance features (see table 39). Pinch points identify areas where movement is highly constrained within a corridor, meaning that habitat loss or degradation in these locations strongly impacts overall connectivity. Pinch points are determined based on current density (using circuit method described above), revealing bottlenecks that function as critical passageways for wildlife movement.

By integrating Linkage Mapper outputs with Circuitscape current flow maps, a thorough assessment of landscape connectivity can be built. Least-Cost Paths highlight direct linkages between core areas, while Pinch Point analysis highlights areas of high risk to connectivity. The results from these analyses will be reviewed alongside additional reference layers, such as designated sites, species records data from the local biological records centres, areas under conservation management, and planned developments, to guide the recommendations for sites to be allocated for development, or designated as Local Wildlife Sites, in the emerging local plan. Details of how the model was developed are provided in the following sections.

Limitations

The outputs of any model depend on the quality and degree of uncertainty of the input data as well as the conditions and assumptions built into it. Furthermore, actual landscapes are more complex than discrete representations of “habitat” or “no habitat” included in model parameters. Habitat quality (or preference) generally varies along a gradient from completely unsuitable to optimal (or most preferred) habitat (Strange, Panzacchi, & van Moorter, 2019). Private gardens for example can vary from extremely high habitat quality if managed specifically for wildlife to very low if covered in decking and artificial grass. A metric for green infrastructure can only generalise as to the expected average habitat quality of a given habitat.

To manage these limitations, model inputs were based on a literature review (evidence provided within the relevant section) and expert judgement. The GBI was then further tested against aerial imagery and evidence collected during the field surveys of the potential site allocations, to ensure these reflected actual habitats within Adur.

Stage 1: Establish model baseline

Protected sites

Information on statutory and non-statutory designated sites were obtained from the local records centre and freely available internet resources (MAGIC) (DEFRA, n.d.) and location of these mapped using ArcGIS.

Habitats

The local records centre provided information on protected and notable habitats and species, including non-statutory designated sites, ancient woodland and HPI

Additional data sources were reviewed and incorporated, as presented in the Table 37.

Table 37: Model data sources

Dataset	Source	Coverage	Accessibility
OS MasterMap Greenspace	Ordnance Survey	National	Free via PSGA
OS Open Roads	Ordnance Survey	National	Public
OS MasterMap Topography[6]	Ordnance Survey	National	Free via PSGA
Sussex BOAs	Adur District Council Sussex Biological Records Centre	County	Private
Local Wildlife Sites	Adur District Council Sussex Biological Records Centre	District	Public Private
Local Nature Reserves	Adur District Council Sussex Biological Records Centre	District	Public Private
HPI	MAGIC (DEFRA, n.d.) Sussex Biological Records Centre	District	Public Private
Ordinary Watercourses	Adur District Council	District	Public

Habitat quality

The primary dataset used was the OS MasterMap Greenspace layer, which details urban greenspaces and classifies them as previously discussed. This was the basis for landcover type within the urban zones, in the absence of more detailed data from other land cover data sets. LandCoverMap 2019 (CEH), for example, designated the majority land within urban areas as “Urban”, “Suburban” or “Improved Grassland” - which would then ignore the differentiation between different green spaces within urban areas. These subtleties are necessary, as the output of the project is to inform detailed green infrastructure strategies and some green and blue spaces provide more ecosystem services than others and are therefore considered to be more valuable in the context of this study.

Habitat quality refers to a combination of landscape features that provide the crucial resources required for long-term persistence of a species or ecosystem (Strange, Panzacchi, & van Moorter, 2019).

Although high habitat quality is associated with natural habitats, high habitat quality can also be found within urban areas. A study in 2006 found that the amount of urban cover that

[6] These data were used to derive the footprint of buildings.

surrounded a site was not related to the plant community present on the site (Angold, 2006) and Hardy et al (1999) found that small urban green space patches are useful for providing nectar resource for vagrant butterflies.

Different types of habitats often included in green infrastructure have very variable habitat quality. Studies are available for some of these habitats for example indicating the ecological value of habitats such as allotments (Baldock, 2019) (Borysiak, 2015) and cemeteries (Loki, 2019) (Castel, 2018) (Wheater, 1999).

The valuation of the differing land cover types contained with OS MasterMap Greenspace data is shown in Table 38. These are based on a combination of habitat quality and connectivity.

To enhance ecological relevance, data from HPI was integrated into the resistance raster. Where HPI designated habitat overlapped with OS Greenspace, the assigned resistance values were reduced to reflect the increased ecological value and likely improved habitat suitability for movement. All though the reduction to resistance was small, this adjustment helped ensure that areas of higher conservation priority were more permeable in the model, and better representing their potential as connectivity corridors.

Table 38: Valuation of habitat quality

Feature	Class	Justification
Allotments Or Community Growing Spaces	4	The value of allotments to wildlife is well recognised. It has been found that allotments and community gardens are pollinator hotspots due to their high pollinator diversity (Baldock, 2019) and that they have on average, up to 30% higher species diversity than urban parks (National Society for allotment and leisure gardeners, n.d.). Borysiak et al (2016) found that allotment areas studied in Poland exhibited high plant species richness and diversity and concluded that "allotment gardens should be considered as biodiversity hotspots for native species within green infrastructure".
Amenity - Residential Or Business	3	Often shortly mown grass with manicured ornamental planting. However, planting can provide food for pollinators and often includes trees which increases connectivity (Tremblay, 2011) (Grafius, 2017)
Amenity - Transport	3	Grafius et al (2017) found that major road verges, may act as valuable movement corridors however their high current variability suggests this may only be true in some cases or at specific points in the network. Additionally, the roads themselves act as barriers to movement, presumably leading to a complex mixture of conflicting effects. Della et al 2017 found that the stag beetle remains within the proximity of urban settlements and is positively affected by the presence of roads.
Bowling Green	1	Shortly mown grass with little biodiversity value
Camping Or Caravan Park	2	The value of camping and caravan parks will be very variable and range from a site entirely covered by concrete to much less intensively managed areas. Most sites would at least include some trees which increases connectivity (Tremblay, 2011) (Grafius, 2017) as well as ornamental planting.
Cemetery / religious grounds	4	Due to their relatively undisturbed nature and long-term existence cemeteries and churchyards can be of considerable value to wildlife. Loki et al (2019) found that they often at as refuges for populations of rare and endangered species and Castel et al (2018) described how urban churchyards are home to a surprising diversity of lichens, wildflowers and animals. Wheater (1999) described how largely undisturbed habitats in churchyards and cemeteries can support rare plants and lichens on gravestones and provide basking sites for reptiles. Most sites would at least include some trees which increases connectivity (Tremblay, 2011) (Grafius, 2017)
Golf Course	3	Tanner & Gange (2005) found that the three indicator taxa studied; birds, beetles and bumblebees showed higher species richness and higher abundance on the golf course habitat than in nearby farmland. They concluded that golf courses of any age can enhance the local biodiversity of an area by providing a greater variety of habitats than intensively managed agricultural areas. Colding & Folke (2009) undertook an analysis of studies in the scientific literature which compared biota on golf courses to that of biota in green area habitats related to other land uses and found that golf courses had higher ecological value in 64% of comparative cases
Institutional Grounds	2	Often shortly mown grass with manicured ornamental planting. However, planting can provide food for pollinators and often includes trees which increases connectivity (Tremblay, 2011) (Grafius, 2017)
Natural	5	Natural habitat will have the highest habitat quality and connectivity value as it will provide the resources required for our native species and the least resistance for movement. Areas in positive management will be of greatest value.
Other Sports Facility	0	Often hardstanding or shortly mown grass with little biodiversity value.
Play Space	0	Often hardstanding or shortly mown grass with little biodiversity value.
Playing Field	2	Often shortly mown grass with little biodiversity value.
Private Garden	4	The value of private gardens to wildlife is obviously very variable depending on how they are managed. However, several comprehensive studies have attempted to show their value for biodiversity. The BUGS research project (1999–2007) carried out by the University of Sheffield was the first large-scale study to reveal the importance of domestic gardens for urban biodiversity. The evidence gathered showed, that the extent of gardens, their unique features, and the biodiversity they support makes them a nationally important ecological resource, contributing enormously to conservation and human–nature interactions in urban environments **(Sheffield, 2007)**. Davies et al (2009) carried out a national scale inventory of resource provision for biodiversity within domestic gardens and found that gardens provide one bird feeder for every nine potentially feeder-using birds in the UK, and at least one nest box for every six breeding pairs of cavity nesting birds. Gardens also contain 2.5–3.5 million ponds and 28.7 million trees, which is just under a quarter of all trees occurring outside woodlands. Modelling suggests that gardens form an important role in urban habitat connectivity.
Public Park or Garden	3	Borysiak et al (2015) found that urban parks, in comparison to allotment gardens, lack the species richness of allotments and do not score well within provisioning ecosystem service.
School Grounds	2	These will be very variable. They often will mostly consist of shortly mown grass with little biodiversity value; however, planting can provide food for pollinators and often includes trees which increases connectivity (Tremblay, 2011) (Grafius, 2017). Often, they will also include a small nature area which could include a pond.
Tennis Court	0	Likely to be hardstanding of little value to wildlife
Water features – Rivers and streams	4	Rivers and streams are important for biodiversity and provide a range of ecosystem services, including pollution control, carbon sequestration, flood protection and health and well-being (Office of National Statistics, 2015) (Mitsch, Bernal, & Hernandez, 2016). At a landscape scale it is not possible to determine habitat quality, however it is assumed that rivers and streams have a high habitat quality.
Water features – Drainage lines	1	Although drainage ditches do provide habitat for a range of species at a landscape scale, their association with roadsides, farmland and ephemeral nature, significantly increase their changes of being highly polluted and provide minimal habitat for a range of species.
Wetlands	4	As with rivers and streams, wetlands identified as being Habitats of Principal Importance under the NERC Act (2004), mean that their quality, whilst variable, is likely to be higher than that of poorly managed, wetlands or stocked lakes.

Establish landscape permeability

For the analysis of the least-cost path, quantified data are needed to estimate the resistance of the target species depending on the characteristics of various substrate surfaces. The following section details the data used in the creation of the resistance layer and the processes and assumptions that were made in its calculation.

All layers were clipped to the study area and rasterised to cell size 5 in preparation for their use in the Habitat and Resistance Calculator tool. The tool requires that each value in the raster be assigned a resistance score, for the output to reflect the variations in resistance within each layer. These scores should be based on ecological knowledge and peer-reviewed evidence of the resistance created by different land covers, the presence of roads, etc.

Resistance values should fall between 1-100. One indicates ideal conditions that provide zero resitance to the species moving across it, with numbers above one indicating how far a species would go out of its way to avoid that area, with the maximum being 100. The SUM calculation method was used to account for confounding impacts of multiple features being present, for example, the presence of a road within a built up area would provide additional resistance than either the built up area or the road alone (McRae, Shirk, & Platt, 2013). This would also allow easier weighting of features providing severe barriers to movement, whilst also allowing for the necessary variation between greenspace features. Use of the SUM calculation method also enables features to be given negative values as well as positive values. Negative values can be used to indicate features which would reduce resistance if present, rather than contribute to additional resistance.

Habitat quality

The rankings of the land cover types detailed in Table 38 were converted into resistance scores between 1-100 which is detailed in Table 39, below. The OS MasterMap Greenspace layer has the most complete coverage of the study area, but there are still small gaps in places, such as some man-made structures – these would be represented as NODATA. It is important to avoid NODATA values within input layers, as these are read as areas of infinite resistance. Accordingly, OSMM topography data was used to fill in any gaps with resistance values based on the feature type.

Table 39: Resistance values

Data Layer	Class	Class Description	Resistance	Expand Cells
OSRoads (as polygon)	1	Motorway	95	0
OSRoads (as polygon)	2	A road	85	0
OSRoads (as polygon)	3	B road	70	0
OSRoads (as polygon)	4	Local/Minor	55	0
Buildings (as polygon)	1	Present	95	0
OS MasterMap Greenspace	0	Worst	50	0
OS MasterMap Greenspace	1	Very Bad	40	0
OS MasterMap Greenspace	2	Bad	30	0

Data Layer	Class	Class Description	Resistance	Expand Cells
OS MasterMap Greenspace	3	Average	20	0
OS MasterMap Greenspace	4	Good	10	0
OS MasterMap Greenspace	5	Best	0	0
HPI	1	Present	-15	0
Ordinary Water	1	Bridge	-10	1
Ordinary Water	2	Culvert	-10	1

Stage 3: Least-cost pathway

The Linkage Mapper tool uses vector core habitat areas and a resistance map to identify core areas and creates maps of least-cost corridors between them. This allows users to identify routes that encounter fewer features impeding movement between core areas.

To ensure that least-cost path calculations were carried out through the urban area, all core area pairs were connected, rather than only adjacent pairs, and corridors that intersect other core areas were removed. This forced movement through the urban area, rather than allowing least-cost paths to be calculated entirely on the urban periphery or along the coast.

This was further supported by basing the core areas on LWS, which have a good spread through the area., BOAs were additionally used (see figure 2). This was because the aim was to find appropriate routes for GBI across Adur, and LWS and BOAs are selected for their biodiversity based on land cover, geology and other characteristics. As such, it made sense to utilise these areas as cores to avoid additional complications of parametrising the core area calculator for a generic urban species.

Stage 4: Determining the GBI network

The Circuitscape® analysis and least-cost pathway is presented in Figures 6 and 7. The spectrum ranges from high resistance (low connectivity) in the reds, and lower resistance in the greens.

In December 2021, Natural England published their green infrastructure mapping tool that details (Natural England, 2021):

- Green and blue infrastructure assets across England
- Access to Natural Green Space Standards (ANGSt)
- Linear access network
- Designated and defined areas
- Access to Nature Close2Home
- Accessible Natural Greenspace Inequalities
- Socio-economic statistics

A 50m buffer was then established either side of the least-cost pathway and railway line and the GBI network was established by overlaying the buffer to the existing GBI assets and including all of those that intersected with the buffer, along with all statutory and non-statutory designated sites. Where statutory and non-statutory designated sites did not intersect with the buffer, these were included in the network as stepping stones within the GBI network.