



# Ecological Assessment

Henham Road,  
Elsenham

On Behalf of:  
Countryside Properties Ltd

July 2022

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**Ecology, Countryside Management**  
Professional Service ● Pragmatic Solutions

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# **SES Quality Management**

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Site assessments / surveys (where required) have been restricted to a level of detail required to achieve the stated objectives of the work.

Due to the temporal nature of ecology, the findings of this report should not be relied upon if a significant amount of time has passed, as defined by the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines.

## **Executive Summary**

- 1.** This report presents the findings and recommendations of ecological surveys undertaken at land south of Henham Road, Elsenham, Essex. The proposals are for the construction of new residential housing at the site.
- 2.** The site was approximately 5.3ha in extent and comprised improved grassland, species-poor hedgerows and trees. The Stansted brook and woodland are adjacent to the southern site boundary and the wider landscape comprised residential housing and arable land. In addition to the site, an area of 2.3ha of off-site land is proposed for the delivery of further ecological enhancements.
- 3.** The site falls within the Zone of Influence (ZOI) of Hatfield Forest SSSI and Elsenham Woods SSSI and indirect impacts on these sites are possible as a result of the development. Provision of onsite open space, links to public rights of way and financial contribution towards the management of Elsenham Woods SSSI as well as the Hatfield Forest mitigation strategy will be required.
- 4.** Recommendations have been provided for bats and nesting birds. These are primarily to retain suitable habitats wherever possible and to incorporate enhancements within the development.
- 5.** Badgers, breeding birds, reptiles, hedgehog and common toad may utilise the habitats available onsite in a transient nature, and therefore mitigation and enhancement measures are proposed for these species, including precautionary working methods, retention and protection of existing habitats and new habitat creation.
- 6.** Overall, the habitats on site are considered to be of up to local ecological value only.
- 7.** Through implementing the recommended measures detailed in this report, it is considered that any adverse effects from the proposed development on the habitats and species on site will be fully mitigated. With suitable enhancement of the habitats on site, and on the off-site ecological enhancement area, there would be scope for a net gain in biodiversity of at least 20%, in line with wildlife legislation and national planning policy (MHCLG, 2021), and local planning policies related to biodiversity.

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## **1.0 Introduction**

- 1.1** Southern Ecological Solutions Ltd. (SES) was commissioned by Countryside Properties (UK) Ltd to undertake a Ecological Assessment in order to inform a planning application for residential housing on land south of Henham Road, Elsenham, Bishop Stortford (referred to as ‘the site’) (Appendix 1a). The site is located centrally at Ordnance Survey (OS) Grid Reference TL 53995 26268 and is approximately 5.3ha in extent.
- 1.2** This report presents the findings and recommendations of Preliminary Ecological Appraisal (PEA) as well as the subsequent phase 2 surveys to date, to inform a planning application for residential development of the site.
- 1.3** The site comprised improved grassland, scattered trees and scrub. The scattered trees and scrub were located around the site boundaries. The land adjacent to the site was residential housing to the north-west, arable land to the east and west and woodland to the south. Directly south is Stansted Brook with a contributory stream/ditch southeast of the site.
- 1.4** In addition the site, an area of 2.3 ha of off-site land is proposed for the delivery of further ecological enhancements (see Appendix 1b).
- 1.5** The proposed development is the construction of new residential housing comprising approximately 130 units with associated infrastructure. This is shown in Appendix 2.
- 1.6** The PEA was conducted in February 2022 by SES. This survey aimed to:
- Map the main ecological features within the site and compile a plant species list for each habitat type;
  - Make an initial assessment of the presence or likely absence of species of conservation concern
  - Identify any legal and planning policy constraints relevant to nature conservation which may affect the development (see Appendix 3);
  - Determine any potential further ecological issues;
  - Determine the need for further surveys and mitigation; and
  - Make recommendations for minimising impacts on biodiversity and providing net gains in biodiversity where possible in accordance with Chapter 15: *Conserving and Enhancing the Natural Environment*, of the National Planning Policy Framework (MHCLG, 2021), and relevant nature conservation policies within Uttlesford District Council’s local planning policies.

## **2.0 Methods**

**2.1** The following PEA follows guidance and methods as prescribed by the Chartered Institute for Ecology and Environmental Management (CIEEM) Guidelines for Ecological Appraisal 2nd edition (2017) and the Guidelines for Ecological Impact Assessment (2019). Following these methods, a baseline of rare and/or noted ecological receptors (species and habitats) was established and valued. Predicted significant impacts upon these receptors have been identified and constraints and opportunities identified. This step-wise assessment process has informed likely mitigation and enhancement measures. These surveys will fully inform the predicted impacts of the scheme in accordance with the NPPF (MHCLG, 2019), local planning policy and relevant wildlife legislation.

**2.2** CIEEM guidelines for Ecological Assessment in the United Kingdom (2019) have been utilised to assess the impacts upon habitats within the zone of influence of the site. CIEEM suggests that it is best to use the geographical scale (i.e. international, national, regional etc.) at which a feature (i.e. a habitat, species or other ecological resource) may or may not be important as the appropriate measure of value. As such, data from the data search, extended Phase 1 Habitat survey and subsequent species-specific surveys has been reviewed and the likely occurrence of protected and notable species/species groups assessed. This has allowed predictions of impacts to be made along with recommendations for mitigation, compensation and enhancement.

**2.3** The following geographical scale categories are considered appropriate:

- International;
- National (*i.e.* England);
- Regional (East Anglia);
- County (Essex);
- District (Uttlesford);
- Local or Parish (Bishops Stortford); and
- Within Site only.

### **Desk Study**

**2.4** SES commissioned a data search for records of protected and notable species from the Essex Field Club (EFC). The data search encompassed the study area, and up to 2km from the boundary.

**2.5** Hazel dormouse *Muscardinus avellanarius* records were also sought from the National Biodiversity Network (NBN) Atlas [www.nbnatlas.org](http://www.nbnatlas.org), which holds data from the People's Trust for Endangered Species (PTES). As dormouse are particularly under-recorded, the data search for this species encompassed an area of up to 10km from the site boundary.

**2.6** A web-based search was undertaken for national statutory designated sites via the Multi Agency Geographic Information for the Countryside (MAGIC) spatial data resource [www.magic.gov.uk](http://www.magic.gov.uk) was undertaken in February 2022 (5km from the site boundary).

**2.7** Maps of the site and wider area, using the MAGIC online spatial data resource and aerial photographs on Google Earth (Google Inc., 2011), were examined to determine potential notable habitats on and adjacent to the site and the wider landscape. In particular waterbodies (within 250m of the site

boundary), watercourses and other landscape features that may be of ecological significance to protected species, notably great crested newt *Triturus cristatus* and mobile species such as bats and birds.

### **Extended Phase 1 Habitat Survey**

- 2.8** An extended Phase 1 habitat survey was carried out on 24 February 2022 by suitably experienced ecologist Gwilym Pask-Hale BSc (Hons) MSc ACIEEM. This is a standard technique for obtaining baseline ecological information for areas of land, including proposed development sites. Phase 1 Habitat Survey methods are set out in the *Handbook for Phase 1 Habitat Survey* (Joint Nature Conservation Committee (JNCC), 2010). Habitat mapping was undertaken using the standard classification to indicate habitat types.
- 2.9** The dominant and readily identifiable higher plant species identified in each of the various habitat parcels were recorded and their abundances assessed on the DAFOR scale:
- D - Dominant
  - A - Abundant
  - F - Frequent
  - O - Occasional
  - R - Rare
- 2.10** These scores represent the abundance within the defined area only and do not reflect national or regional abundances. Plant species nomenclature follows Stace (2010).
- 2.11** All impacts upon ecological features have been considered for the purposes of this survey following industry best practice guidance. Only relevant protected and notable species have been discussed within this report to keep its contents concise and relevant to the works being undertaken and for ease of application.

### **Protected and Notable Species**

#### **Badger**

- 2.12** An initial assessment was undertaken as part of the PEA to identify areas that might be used by badger *Meles meles* for foraging, commuting and sett creation, such as earth banks, woodland, hedgerows and rough grassland. This assessment also included the recording of signs such paths, hairs, latrines and setts. The survey area comprised the development site (red line area; see Appendix 1) and within 30m of this boundary where open access was available.

#### **Bats**

- 2.13** The site was assessed for its suitability to support roosting, foraging and commuting bats. Trees and the building were assessed for their potential to support roosting bats using guidelines issued by the Bat Conservation Trust (BCT) (Collins, 2016). Roosting habitats were assigned a level of suitability according to the descriptions outlined in Table 1.

**2.14** Good bat foraging habitat generally includes sheltered areas and habitats with good numbers of insects, such as woodland, scrub, ponds, lakes and species-rich or rough grassland. Good commuting habitat generally comprises linear features such as well-connected hedgerows, woodland edge and watercourses. The site was assigned a level of suitability according to the descriptions outlined in Table 1.

**Table 1: Assessment of the potential suitability of a proposed development site for roosting, foraging and commuting bats (Collins, 2016)**

Suitability	Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats	Negligible habitat features on site likely to be used by commuting and foraging bats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically but not enough space, shelter, protection and appropriate conditions to be used on a regular basis or by larger numbers of bats  A tree of sufficient size and age to contain potential roosting features but with none seen from the ground or features seen with only very limited roosting potential	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat  Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or patch of scrub
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens  Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge  High-quality habitat that is well-connected to the wider landscape that is likely used regularly by foraging bats such as broad-leaved woodland, tree-lined watercourses and grazed parkland  Site is close to and connected to known roosts

### Bat Activity Surveys

**2.15** To assess the value of the site for foraging and commuting bats, and assess the species assemblage and numbers present, three bat activity surveys are conducted seasonally between April to October 2022. A predefined route was walked by two surveyors each month throughout the period outlined above. Surveyors were equipped with recording devices BatLoggers with recording capabilities for later analysis.

**2.16** During the transect the number of bat passes were recorded, together with the species, where possible, and the time of detection. All bat passes were recorded, and all bats were identified to species level, where possible on site. Echolocation calls were subsequently analysed using software (Kaleidoscope/ Batexplorer) for confirmation of species. Where possible, additional notes on size, flight height, types of flight (such as commuting, foraging) and direction of flight were also recorded. Bat activity surveys were carried out in favourable conditions when bat activity was deemed to be



likely (sunset temperature 10°C or above, no rain or strong wind). A transect route was devised, encompassing the main habitats on site, where possible. Surveyors stopped every 20 minutes for five minutes and recorded all bat activity during the point count. Transects were conducted once per season from April. (Summer and Autumn transects are pending). See Appendix 10 for transect route.

### Static Monitoring

- 2.17** Two automated recorders (Anabat Swift or similar) were placed at different locations within the site boundary for five consecutive nights per season between April and October 2022 to record the bat activity on site. The automated recorders were programmed to begin recording 30 minutes before sunset and terminate recording 30 minutes after sunrise. This period covered the peak time bats would be commuting to and from their roosts. If the features were used as an important flight line, then the number of bat passes recorded would be high at that corresponding time. See Appendix 10 for static locations.

### **Birds**

#### Preliminary Assessment

- 2.18** The sites' suitability to support a notable bird assemblage was initially assessed during the preliminary ecological appraisal. Suitable breeding habitat generally includes scrub, hedgerows, trees and ruderal vegetation but can also include buildings, open ground, grassland, arable cropland and piles of debris. The site was also assessed at this time for its potential to support significant wintering and/or migratory bird populations.

#### Breeding Bird Surveys

- 2.19** A breeding bird survey was undertaken using the standard Common Bird Census (CBC) methods, devised by the British Trust for Ornithology (BTO) (Marchant, 1983; Bibby et al., 1992). This comprised three visits in April, May and June 2022. Detailed methods are provided in Appendix 4.

### **Great Crested Newt**

- 2.20** Aquatic habitats on and within 250m of the site (where accessible) were assessed for their suitability to support breeding great crested newt (as well as other amphibians) using the Habitat Suitability Index (HSI). Further detail on the HSI method is provided in Appendix 4.
- 2.21** Terrestrial habitats on site were also assessed for their suitability for great crested newt as part of the PEA. Suitable terrestrial habitat generally includes rough grassland and woodland where they can forage and hibernate, with good links to the ponds where they breed.

### **Hazel Dormice**

- 2.22** Habitats were assessed for their general suitability for hazel dormice. This species generally uses areas of dense woody vegetation and are more likely to be found where there is a wide diversity of woody species contributing to a three-dimensional habitat structure, a number of food sources, plants suitable for nest-building materials and good habitat connectivity.

## **Invertebrates**

- 2.23** The site was assessed for its potential to support rare or notable invertebrate species as part of the PEA. This assessment was made on the basis of the habitats present and their structural complexity and diversity, giving particular consideration to rare and notable species recorded in the local vicinity.

## **Reptiles**

- 2.24** The site was assessed for its suitability for the four commoner reptile species during the extended PEA; common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix natrix* and adder *Vipera berus*. Specific habitat requirements vary between species. Common lizards favour rough grassland, however they can be found in a variety of habitats ranging from woodland glades to walls and pastures. Slow-worms use similar habitats to common lizards and are often found in gardens and derelict land. Grass snake have similar habitat requirements to common lizards but have a greater reliance on ponds and wetlands where they hunt amphibians. Adders occupy areas of rough, open countryside and are often associated with woodland edge habitats.

## **Other Notable Species**

- 2.25** The PEA included a first stage assessment of the suitability of habitats on site to support NERC Act 2006 Species of Principle Importance (SPI) which are likely to occur in the local area, including hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, harvest mouse *Micromys minutus*, polecat *Mustela putorius* and common toad *Bufo bufo*.

## **Constraints**

- 2.26** Desktop data searches are a valuable tool in evaluating a site's potential to hold rare and protected species, it is not however an absolute in confirming presence or absence of notable species due to the nature of how the records are collected.
- 2.27** The grassland on site is heavily grazed meaning many of the species within could not be identified.
- 2.28** The Phase 1 Habitat Survey was undertaken outside of the optimal period to identify certain species of flowering plant. As such the species list will not be exhaustive, however this does not impact identification of habitats which are unlikely to be of significant value.

### 3.0 Baseline Ecological Conditions

#### Designated Sites

- 3.1 There were no sites designated under the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations 2019 within 10km of the site.
- 3.2 There were five sites within 5km designated under the Wildlife and Countryside Act 1981 or under Section 21 of the National Parks and Access to the Countryside Act (1949). Seven non-statutory designated sites were located within 2km of the site, these are listed in Table 2 below.
- 3.3 The site falls within the SSSI Impact Risk Zone which requires 'Residential development of 50 units or more' warrant consultation with Natural England.
- 3.4 All of these sites are considered to be of **National** value.

**Table 2. Nationally Designated Sites within 5km and Statutory and Non-Statutory Locally Designated sites within 2km of the site.**

Site Name	Distance & Direction	Size (ha)	Description & Reason for Designation
<b>Nationally Designated Sites</b>			
<b>Elsenham Woods SSSI</b>	1.7km East	44.42	Elsenham Woods are predominantly ancient mixed woods supporting the wet ash <i>Fraxinus excelsior</i> maple <i>Acer campestre</i> , oak <i>Quercus robur</i> -hornbeam <i>Carpinus betulus</i> and wych elm <i>Ulmus glabra</i> woodland types. The site comprises Eastend Wood and Pledgdon Wood, both situated on the chalky boulder clay of north-west Essex, less than half a mile apart.
<b>Hall's Quarry SSSI</b>	2.4km Northwest	0.7	Geographic site of SSSI
<b>Quendon Wood SSSI</b>	4.7km southwest	33.51	Quendon Wood is an ancient coppice-with-standards woodland supporting an unusually rich and varied flora associated with a range of soil types. The Pedunculate Oak -Hornbeam woodland includes both the rare Birch-Hazel variant and the Ash-Maple variant, developed over Chalky Boulder Clay and glacial gravels.
<b>Hatfield Forest SSSI/NNR</b>	4.8km south	410.78	Hatfield Forest is unique in being the last small mediaeval Royal Forest to remain virtually intact in character and composition. The Forest, together with the purlieu woods: Wall Wood, Monk's Wood and Wallis's Spring, was originally an outlying part of the extensive Forest of Essex and still covers over 400 hectares of mixed ancient coppice woodland, scrub, unimproved grassland chases and plains with ancient pollards, and herb-rich marshland bordering a large lake.
<b>Flich Way LNR</b>	4.8km South	4.39	Countryside experience with the opportunity to spot wildlife.
<b>Local Designated Sites</b>			
<b>Alsa Wood LWS</b>	0.8km West	26.4	Large ancient wood, a former SSSI, was bisected by the M11.
<b>Lady's Wood/Regent's Spring LWS</b>	1.16km East	11.9	The eastern and western sections of Lady Wood has a coppice-with-standards structure

Site Name	Distance & Direction	Size (ha)	Description & Reason for Designation
Wilkin's Plantation LWS	1.2km Southwest	1.7	This small streamside wood, not obviously planted, has a rich flora for its size.
Eastend Lane LWS	1.29km East	0.5	This section of lane has been designated on account of its grassland flora, although the well maintained species-rich hedges also add to the wildlife value of the site.
Durrel's Wood LWS	1.37km Southwest	9.1	This Site is extended to include two fragments to the south overlooked during the original SINC identification process. Durrel's is an old wood has several attributes of ancient woodland.
Aubrey's Burton Reserve LWS	1.6km West	9.1	This reserve is a complex of copses, grassland and numerous ponds that attracts a wide variety of wildlife.
Turner's Spring/The Bourne LWS	1.74km Southwest	4.0	This Site largely comprises the Essex Wildlife Trust's Turner's Spring nature reserve but it also includes a narrow strip of streamside woodland that connects this area to the southern tip of Durrel's Wood.

Key: LNRS – Local Nature Reserve, SSSI – Site of Special Scientific Interest, LWS – Local Wildlife Site

## Habitats

3.5 A Phase 1 habitat map of the site and target notes are provided within Appendix 5. Site photographs are illustrated in Appendix 6. Plant species recorded per habitat type are tabled in Appendix 7.

3.6 The Phase 1 Habitat types (JNCC, 2010) within the development site (red-line area) were:

- Improved grassland
- Intact species-poor hedgerow
- Scattered trees/line of trees

### Improved grassland

3.7 The majority of the southern area of the site was improved grassland in the form of a horse paddock. The primary species present are grasses however due to grazing the specific species could not be identified. Other species included dandelion *Taraxacum officinale agg.*, common nettle *Urtica dioica* and curl leafed dock *Rumex crispus*. This habitat was considered to be **up to local** level importance.

### Intact species-poor hedgerow

3.8 A hedgerow is present along the western boundary and shows signs of cutting and maintenance. Whilst it is maintained as a hedgerow it is primarily dominated by bramble *Rubus fruticosus agg* and lacks other woody species. Rare instances of spear thistle *Cirsium vulgare*, snowdrop *Galanthus nivalis* and daffodil *Narcissus pseudonarcissus* were also present. This habitat is **site** level importance, as without the woody species it does not meet the criteria of a priority habitat.

### Scattered trees/line of trees

3.9 Scattered trees are located around the site, primarily in a line of trees along the western boundary, as well as a line of trees partly bisecting the site from east to west and a few isolated trees. Species

included oak, hawthorn, beech and alder. These trees are isolated from other trees and woodlands therefore this habitat was considered **site** level importance.

### Summary

- 3.10** The habitats aside from the grassland on site were of site importance only. The grassland is likely also site importance however the grazing reduces the ability to identify the grass species. Whist hedgerows are considered habitats of principle importance (HoPI), the only hedgerow like habitat was composed of bramble and not qualifying as a priority hedgerow. However, these are not impacted by the development.

### **Protected and Notable Species**

- 3.11** Protected species are animals and plants listed on Conservation of Habitats and Species Regulations 2019 as amended and The Wildlife and Countryside Act as amended (WCA) 1981, The Protection of Badgers Act 1992, or listed in Section 40 or 41 of the NERC 2006. Protected and notable species with existing records within 2km of the site are detailed below.

### Flora

#### *Desk Study*

- 3.12** 12 records of Schedule 8 protected plant were of bluebell *Hyacinthoides non-scripta*.
- 3.13** 37 records of Schedule 9 invasive plant species were reported in the data search. Species include Indian Balsam *Impatiens glandulifera*, New Zealand Pigmyweed *Crassula helmsii*, Japanese Knotweed *Fallopia japonica*, Rhododendron *Rhododendron ponticum*.

#### *On-site Assessment*

- 3.14** During the extended Phase 1 survey, no protected or invasive species were observed on site.
- 3.15** No protected, rare or notable species were recorded, though it is possible this is due to the heavy grazing present on site.

#### *Importance*

- 3.16** The botanical assemblage of the development site was considered to be of **site** value only, as no protected flora were recorded.

### Badger

#### *Desk Study*

- 3.17** There were 10 records of badger returned on the data search within 2km of the site.

### On-site Assessment

**3.18** The site contains suitable sett building, foraging and commuting habitats for badgers around the field boundaries. No evidence of badgers was observed on site.

**3.19** The site is assessed as being of **site** importance for badgers with the presence of suitable habitats and its size, confidence in this assessment is currently **high**.

### Bats

#### Desk Study

**3.20** Records of bats identified within 2km of the site are summarised in Table 3 below.

**Table 3. Summary of bat records within 2km of the site.**

Species	Nearest approximate distance to site (km)	Total No. of Records	Date of Most Recent Record
Common pipistrelle <i>Pipistrellus pipistrellus</i>	0.2	60	2017
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	0.1	17	2014
Unidentified Pipistrelle species <i>Pipistrelle sp.</i>	0.8	25	2016
Natterer's bat <i>Myotis nattereri</i>	0.9	11	2009
Noctule <i>Nyctalus noctula</i>	0.4	3	2014
Brown Long-eared Bat <i>Plecotus auritus</i>	0.9	30	2016

#### Ground Level Tree Assessment

**3.21** Two trees on site were found to have suitable features for roosting bats. Their locations are given in Appendix 5 and are summarised in Table 4 below:

**Table 4. Summary of trees containing potential roost features**

Tree No.	Species	Potential to support roosting bats	Details
1	Oak	Moderate	Multiple instances of peeling or malformed bark throughout the trunk, three dead branches in the top of the crown and an additional dead branch two thirds of the way up the height of the tree.
2	Ash	Low	Single branch cavity 7m up on the east side of the tree.

#### Importance

**3.22** Two trees on site were found to have suitability for roosting bats. The site could have **up to local** importance for roosting bats. Confidence in this assessment is **moderate** and dependant on further surveys.

#### Bat activity surveys

**3.23** Detailed results including heat maps showing the species distribution within the site are provided in Appendix 11 for heat maps.

**Table 5. Summary of transect survey results - passes per species per transect.**

Month	P.pip	P.pyg	N.nyc	P.aur	Total
Spring	93	9	2	3	107
Summer	TBC	TBC	TBC	TBC	TBC
Autumn	TBC	TBC	TBC	TBC	TBC
Mean	93	9	2	3	107

*P.pip* = common pipistrelle, *P.pyg* = soprano pipistrelle, *N.nyc* = noctule, *Nyc. Sp* = *Nyctalus sp.*, *M.dau* = Daubentons bat, *P.aur* – Brown long-eared bat, *Myo sp.* = *Myotis sp.*, *B. bar* = barbastelle

### Static Deployments

**3.24** Analysis of data from static deployments increased the list of bat species associated with the site. See Appendix 10 for static detector locations.

**Table 6. Summary of static survey results for spring, summer & autumn 2022- passes per species per night of recording (standardised for differences in night length over season and combining data for two sampling locations).**

Bat species	Spring		Summer		Autumn		Total
Static Detector I.D.	1	2	1	2	1	2	
Common pipistrelle	57	36	TBC	TBC	TBC	TBC	93
Soprano pipistrelle	0	0	TBC	TBC	TBC	TBC	
Noctule	1	2	TBC	TBC	TBC	TBC	3
Brown Long-eared	0	0	TBC	TBC	TBC	TBC	
Total	58	38	TBC	TBC	TBC	TBC	96
Monthly Total	96		TBC		TBC		96

### Importance

#### Roosting, Foraging & Commuting Bats

**3.25** Bat species found on site are considered to be ‘common’ (common pipistrelle; soprano pipistrelle), and ‘rarer’ (noctule, serotine, and *Myotis sp.*) based on criteria for assessing rarity within range by Wray et al. (2010). Information on the distribution of the bat species in Essex is provided in Table 7.

**Table 7. Distribution of bats in Essex (EBG, 2022)**

Bat species	Status in Sussex
Common pipistrelle	Widespread, occasionally common
Soprano pipistrelle	Widespread, occasionally common
Nathusius’s pipistrelle	Considered rare
Brown long-eared	Widespread, relatively frequent
Noctule	Widespread, but relatively scarce
Leisler’s	Widespread, but scarce and possibly declining
Barbastelle Bat	Possibly more widespread than appreciated, but a scarce woodland bat.
Serotine	Widespread, but scarce.
Daubenton’s bats	Widespread, relatively frequent.

- 3.26** Given the low levels of overall bat activity observed so far and also the absence of passes recorded for 'rarer' species, the site is considered to be of only site level importance for foraging and commuting bats.

### Birds

#### *Desk Study*

- 3.27** The Surrey data search returned 67 records of species listed under Schedule 1 of the WCA 1981 within 2km including green sandpiper *Tringa ochropus*, kingfisher *Alcedo atthis*, red kite *Milvus milvus*, greylag goose *Anser anser*, peregrine *Falco peregrinus*, redwing *Turdus iliacus*, fieldfare *Turdus pilaris* and barn owl *Tyto alba*.
- 3.28** 184 records were obtained for species protected under the Bern convention Robin *Erithacus rubecula*, coal tit *Periparus ater*, dunlin *Calidris alpina*, Dunnock *Prunella modularis*, goldcrest *Regulus regulus*, great tit *Parus major*, Goldfinch *Carduelis carduelis*, greenfinch *Regulus regulus*, Eurasian Blue Tit *Cyanistes caeruleus*, grey wagtail *Motacilla cinerea*, house martin *Delichon urbicum*, kestrel *Falco tinnunculus*, linnet *Linaria cannabina*, little egret *Egretta garzetta*, little owl *Athene noctua*, marsh tit *Poecile palustris*, meadow pipit *Anthus pratensis*, nightingale *Luscinia megarhynchos*, nuthatch *Sitta europaea*, pied wagtail *Motacilla alba*, reed bunting *Emberiza schoeniclus*, sand martin *Riparia riparia*, shelduck *Tadorna tadorna*, short-eared owl *Asio flammeus*, spotted flycatcher *Muscicapa striata*, swallow *Hirundo rustica*, tawny owl *Strix aluco*, tree creeper *Certhia familiaris*, waxwing *Bombicilla garrulus*, wren *Troglodytes troglodytes*, yellow wagtail *Motacilla flava*, yellowhammer *Emberiza citronella* and European Green Woodpecker *Picus viridis*. All of these species are known to breed in the UK and have been recorded within 2km of the site.

#### *Preliminary Assessment*

- 3.29** The improved grassland field on site is suboptimal for ground nesting species such as skylark *Alauda arvensis*. None were observed during the initial assessment, though this was undertaken outside of the nesting bird season. The site itself was relatively small but open. Its habitats are also found throughout the surrounding landscape. This site is considered largely unsuitable for wintering birds due to its grazed and mown condition.
- 3.30** The hedgerows bounding the site and the area of dense scrub to the south of the site were considered to offer suitable nesting habitat for common bird species.

#### *Breeding Bird Survey*

- 3.31** The breeding bird surveys recorded a total of 34 species of which 15 were considered likely to be breeding or utilising the site during the breeding season. The remaining species were not considered to be breeding within the site and were either recorded adjacent to the site or flying over.
- 3.32** There were two red-listed Birds of Conservation Concern (BoCC) in accordance with the most recent conservation assessment (Eaton et al., 2015) recorded using the site. These included starling and mistle thrush were observed visiting the site.



**3.33** There were seven amber-listed BoCC, of which four were considered probable breeding species; dunnock *Prunella modularis*, and stock dove. Survey maps and detailed results are provided in Appendix 8 and 9. The majority of activity was associated with the site’s hedgerow and trees. Results are summarised in Table 8 below.

**Table 8. Summary data on conservation status.**

Conservation Status	BoCC	
	Breeding	Non-breeding
Red	1	2
Amber	4	3
<b>Total</b>	<b>5</b>	<b>5</b>

*Importance*

**3.34** The bird community size is a function of the size of the site and diversity of habitats (see Table 10). The breeding bird community is hence considered as being of **Local** value based on the criteria of Fuller (1980).

**Table 9. Site value based on breeding bird community size (Fuller 1980).**

Number of breeding bird species	Site Value
<25	Local
25-49	District
50-69	County
70-84	Regional
>85	National

*Great Crested Newt*

*Desk Study*

**3.35** The Essex records centre identified 14 records for great crested newt (GCN) 2km of the site.

**3.36** A total of four ponds were identified within the surrounding 250m of the site based on aerial maps. Only one was found to be extant, it’s location is shown in Appendix 12. However, it was south of the Stansted Brook and as such was largely ecologically isolated from the site. Table 5 below provides the HSI results, the calculations are provided in Appendix 13.

**Table 10. Summary of pond**

Pond No.	HSI	Suitability
1	0.697963755679882	Average

*On-site Assessment*

**3.37** Most of the development site was considered to offer unsuitable terrestrial habitat for GCN due to the managed state of grassland. Suitable habitat can be found around the site boundary in the hedgerows

and tree lines as well as in the immediate areas outside of the site such as the banks of the Stansted Brook and its contributory ditch on the east boundary of the site.

#### *Importance*

- 3.38** Given the lack of ecologically connected ponds within 250m and lack of suitable habitat on the site, the site was considered to be of **negligible** importance to any local GCN population, confidence in this assessment is **high**. GCN are not considered further in this report.

#### Hazel Dormice

##### *Desk Study*

- 3.39** Seven records for dormice within 10km of the site were returned from the NBN atlas records search. The 2km search returned no records.

##### *On-site Assessment*

- 3.40** The site was considered to provide little to no opportunities for dormice. The majority of the site is improved grassland with no suitability as it completely lacks woodland or scrub species required to support hazel dormice. The boundary features such as scrub and tree lines have little to no connectivity due to their isolation and are generally suboptimal from lacking woody species or undergrowth respectively.

#### *Importance*

- 3.41** Given the limited suitable habitat on site is restricted to the site boundaries and that the site is surrounded by arable land, habitats on site were considered to be of **negligible** importance to any local dormouse population, confidence in this assessment is **high**. Hazel dormice are not considered further in this report.

#### Invertebrates

##### *Desk Study*

- 3.42** One record was found 0.4km from the site for stag beetle *Lucanus cervus*. Records for red list invertebrate species including small heath *Coenonympha pamphilus* speckled footman *Coscinia cribaria*, bee wolf *Philanthus Triangulum*, digger wasp *Stigmus pendulus* and four-spotted moth *Tyta luctosa* were also recorded within 2km of the site. None were observed on site, though the walkover was taken outside of the optimal time of year for invertebrate surveys.

##### *On-site Assessment*

- 3.43** The site was considered largely sub-optimal to support a notable assemblage of invertebrates due to a history of grazing and lack of egg laying substrate present. The boundary hedgerows contained native flora and were considered to have greater potential. However, given their limited extent, structural diversity, and the restricted range of common flora observed, it was judged they were likely to support only a common invertebrate assemblage. The site lacked the deadwood required by stag

beetle and the highly graze have d nature means there is little in the way of microhabitats to support a diverse population of invertebrates. No further surveys are therefore recommended to adhere to legislation and planning policy.

#### *Importance*

- 3.44** Therefore, the site was considered of **site** level importance for invertebrates, and likely to support a limited assemblage of predominantly common species; no further surveys are therefore recommended to adhere to legislation and planning policy.

#### Reptiles

##### *Desk Study*

- 3.45** The data search returned four records within 2km of the site for slow-worms, four records for grass snake and common lizard.

##### *Preliminary Assessment*

- 3.46** The boundary vegetation on site was considered to provide opportunities for reptiles, with scrub, treelines and hedgerows providing commuting corridors. The interior of the site is grazed and kept clear of detritus or manure and as such considered unsuitable for reptiles.

#### *Importance*

- 3.47** Given the record of reptile species in the local biological records and the suitable habitat across the site it is considered to have **site** level importance for these species. Confidence in this assessment is **high**.

#### Water Vole and Otter

##### *Desk Study*

- 3.48** The data search returned no records for water vole *Arvicola amphibius* but one record for otter *Lutra lutra*.

##### *Preliminary Assessment*

- 3.49** The southern boundary was adjacent to the Stansted Brook, which was fairly fast flowing and largely devoid of suitable foraging habitats for water voles being in a woodland area. The brook was too shallow for otters to create holts, though could be used as a commuting corridor by local populations.
- 3.50** The eastern ditch was largely overgrown with scrub and ruderal plants and is too shallow to present suitable aquatic habitat for either species.

### *Importance*

- 3.51** Given the lack of optimal vegetation and few local records, the site is considered to be of **negligible** value for water voles and **site** value for otter.

### *Other Notable Species*

#### *Desk Study*

- 3.52** Records returned for NERC Act 2006 notable species included 19 for hedgehog, one record of common toad, and 13 for harvest mouse.

#### *On-site Assessment*

- 3.53** Harvest mice require habitats such as tall grassland containing cereal crops, hedgerows, reed beds and dykes for foraging and nest building. The sward height of the improved grassland from being consistently grazed and species recorded on site and within boundary habitats did not offer the structural complexity or species diversity suitable to support harvest mice. As such, this species is considered to be absent from site and not considered further.
- 3.54** Brown hare are closely associated with cereal crops and woodland edges. Habitats within the site are considered negligible, but woodland is present to the south of the site. As such, the site is considered to be of **site** importance for brown hare, with confidence in this currently **high**.
- 3.55** Hedgehogs and polecats can utilise a range of habitats including woodland, hedgerows, residential gardens, farmland and grassland. They are known to nest (summer/maternity/hibernation) in brash piles, dense scrub and buildings. The site had areas of scrub along the western boundary, with suitable habitat for foraging and commuting hedgehogs present in the immediate landscape. It is therefore considered probable that the site is used by individuals for foraging and sheltering. Due to the habitats present on site and within the wider landscape, and the number of records within the wider area for this species, the site is considered to be of **site** importance for hedgehogs, with confidence in this currently **high**.
- 3.56** Common toads require access to aquatic habitats in order to reproduce. Outside of the breeding season, toads can utilise a range of habitats including scrub, hedgerows, woodland, brash piles, buildings and private gardens. Due to the habitats present on site and within the wider landscape and the number of records within the wider area and during the survey, the site is considered to be of **site** importance for common toad, with confidence in this currently **high**. The boundary habitats within the site, hedgerows and trees were considered to provide suitable sheltering and foraging opportunities for common toad.

### *Importance*

- 3.57** The site was therefore considered to have **site** value for brown hare, hedgehog, polecat and for common toad.

Summary

**Table 11. Summary evaluation of features.**

Feature	Summary Description	Value
SSSI/LNR	Elsenham Woods SSSI Hall's Quarry SSSI Quendon Wood SSSI Hatfield Forest SSSI/NNR Flitch Way LNR	National
LWS	Alsa Wood LWS Lady's Wood/Regent's Spring LWS Wilkin's Plantation LWS Eastend Lane LWS Durrel's Wood LWS Aubrey's Burton Reserve LWS Turner's Spring/The Bourne LWS	Local
Habitats	Majority of site made up of improved and improved grassland, scattered trees and hedgerows are present on site.	Site
Flora	No protected / notable flora recorded.	Site
Badger	No evidence of badgers recorded however site is suitable for sett building, foraging and commuting.	Site
Bats	Habitats offer moderate suitability for foraging habitat on-site. Woodland and brook adjacent but not in the site and limited boundary features. Two trees found with potential roost features on site.	Up to local
Birds	No evidence of Schedule 1 species. Habitats suitable for common and widespread species as listed on the BoCC red list.	Up to local
Great crested newt	Only one pond found to contain water during visit and was ecologically isolated from the site. GCN considered absent.	Negligible
Hazel dormouse	Absent locally, no suitable habitat on site.	Negligible
Invertebrates	Limited natural habitats with limited structural diversity. Unlikely to support a notable assemblage.	Site
Reptiles	Limited foraging, commuting and hibernation on site.	Site
Water vole & otter	No suitable habitat for water vole, considered absent. Some suboptimal commuting habitat for otter, connections to more suitable off site habitat.	Negligible Site
Other notable species	Suitable for hedgehog, polecat and toad.	Site

## **4.0 Preliminary Prediction of Impacts, Mitigation & Enhancement Measures**

### **Development Description**

- 4.1** The current proposals include approximately 130 new residential houses with associated gardens, open space and infrastructure.

### **Designated Sites**

#### *Hatfield Forest SSSI*

- 4.2** The site falls within the ZoI for Hatfield Forest SSSI. The ZoI criteria advise likely recreational pressures on Hatfield Forest as a result of residential developments within 14.6km of the SSSI. Potential increases in recreational pressure on this SSSI as a result of the development are predicted without suitable mitigation measures.
- 4.3** A general study of recreational use of the natural environment commissioned by Natural England (Johnson et al. 2009), found that most visitors use designated sites for walking or dog walking. All studies corroborate the general findings that most local users access designated sites on foot within 1km and by vehicle within 8km.
- 4.4** Although Hatfield Forest SSSI is accessible from the application site via footpaths, given the walking distances involved (>7km), it is considered unlikely that people within the proposed development would walk to the SSSIs. The SSSI is considered within a reasonable driving distance (<8km) from the application site.
- 4.5** As Hatfield Forest SSSI has associated parking and amenities, it is likely that people within the proposed development would utilise this SSSI, and although they would opt to use nearby footpaths more frequently, is considered that the proposals could result in increased recreational pressure on this SSSI.
- 4.6** A draft Mitigation Strategy has been prepared by the National Trust (National Trust, June 2019) with regard to Hatfield Forest SSSI, which will be included in relevant local plans was approved. It proposes strategic mitigation measures to be funded by a tariff on new developments within the ZoI (likely to be in the form of a cost per dwelling), with contributions proposed to be secured from developers via section 106 agreement. Policy is still emerging and at this stage, the tariffs have not yet been finalised.
- 4.7** Interim advice from Natural England (24 September 2019 – issued to Uttlesford District Council [UDC]) states that:
- ‘Natural England’s proposed approach in the interim period, so that all local authority partners understand how to apply this new evidence for planning decisions, and what are the next steps towards setting up a strategic approach.’*
- 4.8** The letter states that applications over 50 units will be required to make a financial contribution and that larger projects should provide SANGS (Suitable Alternative Natural Greenspace) and sets the threshold at *‘perhaps 100+ units’*. Therefore, as the proposed development is for 130, SANGS may be required.

**4.9** The following provisions within the green space onsite are recommended:

- High-quality, informal, semi-natural areas
- Circular dog walking routes of >2.7 km and/or with links to surrounding public rights of way (PRoW)
- Signage/leaflets to householders to promote these areas for recreation
- Dog waste bins etc.

**4.10** Therefore, the above onsite provisions should be delivered as part of the proposed development. Informal open space will be created along the eastern boundary of the site and should include a circular route as well as educational signage.

**4.11** Provision of onsite recreational facilities, along with a financial contribution as outlined in paragraph 4.6, is considered to result in a **neutral** residual impact on Hatfield Forest SSSI.

#### *Elsenham Woods SSSI*

**4.12** The site also falls within the IRZ for Elsenham Woods SSSI. The IRZ criteria advise likely impacts as a result of residential developments >100 units. Given the distances between this site and the application site, it is considered highly unlikely that direct impacts during the construction phase (pollution, noise etc.) would impact the SSSI. Potential impacts are therefore limited to indirect effects of increased recreational disturbance during the operational phase of development. There is a Public Right of Way (PRoW) along the southern site boundary which provides a walking route to Elsenham Woods SSSI, measuring 2.2km (or 4.4km return). To mitigate impacts, the site will provide recreational opportunities through the provision of onsite open space and connectivity to the offsite PRoW network. This will be present in the form of public open space (see paragraphs 4.9 and 4.10 above) as well as links to the PRoW to the north and southwest which will provide alternative routes away from the SSSI.

**4.13** The air quality assessment report produced by Ardent Consulting Engineers (Ardent 2022), screened out impacts in relation to air quality on all ecology designations with the exception of the Elsenham Woods SSSI. The assessment found that nitrogen oxides (NO<sub>x</sub>), ammonia (NH<sub>3</sub>) and nitrogen deposition exceeded the screening thresholds.

**4.14** The effects of the increases in NO<sub>x</sub> concentrations are not considered significant in isolation or in combination with committed development. This is due to the predicted concentration modelled within the SSSI woodland remaining below the critical level of 30 µg/m<sup>3</sup>. However, both NH<sub>3</sub> and N. deposition levels modelled exceed critical levels/loads (1 µg/m<sup>3</sup> and 15-20 kgN/ha/yr respectively). The effects of this exceedance is localised close to the road (within 25m and 15m of Hall Road for NH<sub>3</sub> w and N. deposition respectively) when the proposals are assessed in isolation. It should be noted that this area of the SSSI has historically been exposed to concentrations of these pollutants in excess of critical loads/levels. In addition, the area effected is a very small proportion of the wider SSSI. Finally, in order to provide a suitably robust assessment, some appropriately worst-case assumptions have been made by the modelling undertaken (Ardent, 2022). This is likely to have resulted in an over-estimation of pollutant levels to some degree. As such it is concluded that any likely significant effect is predicted to be minor.

**4.15** It should also be noted that when assessing the In-combination effects for NH<sub>3</sub> w and N. deposition it is clear that the proposals are a very small proportion of the predicted increase in traffic flows (3.5% of the total modelled) and the vast majority of the predicted adverse effects are associated with other committed development traffic emissions.

**4.16** Appropriate and proportionate mitigation measures should be agreed with Natural England but will likely include financial contribution to the management of the SSSI woodland to ensure favourable condition maintained as a whole and potential measures such as planting screening where possible and other measures to intercept pollutants. Once this mitigation is agreed it is considered that the development will result in a **neutral** residual impact on the Elsenham Wood SSSI.

#### *Other nearby designated sites*

**4.17** Due to the distance from site (>1.7km) and lack of shared habitats (i.e. no ancient woodland or wetlands), direct and indirect impacts are not considered likely upon other nearby SSSIs, however the local SSSI IRZ necessitates consultation with Natural England for any residential development of 50 units or over due to the possibility of increased visitor pressure. However, the nationally designated sites are not readily accessible from the site itself so it is not considered likely to present a constraint to the development.

**4.18** The nearby locally designated sites similarly lack shared habitats being primarily woodland and not readily accessible from the site, lacking footpaths or other pedestrian access.

#### **Habitats**

**4.19** There are no habitats of principal importance on site. The field boundaries represent the majority of the botanical diversity on site as well as the majority of the suitable habitat for notable or protected species on site. As such it is recommended that the boundary habitats are retained as much as possible as part of the development.

**4.20** It is recommended that all retained habitats are protected during construction works through the provision of suitable fencing such as Heras fencing. Heras fencing should follow BS standard BS 5837:2012 Trees in relation to design, demolition and construction. A 10m unlit ecological buffer is typically recommended along all boundary habitats, however the woodland and brook to the south a buffer of 15m is recommended.

**4.21** A Biodiversity Net Gain of over 20% will be achieved as part of the development. This will be achieved both on site habitat creation and enhancement as well as habitat creation off site in a location east of the site. Precise details are provided in the Biodiversity Net Gain Design Stage Report.

**4.22** New habitats should be created to supplement the boundary habitats and include HoPI such as species rich grassland, ponds and hedgerows. Additional tree and species rich scrub should also be planted to create a mosaic of habitats

**4.23** If boundary habitats are to be removed in part/full, in order to mitigate habitat losses, it is recommended that compensatory planting is undertaken and retained boundary habitats are enhanced with a native, species-rich mixes using species of local abundance through gap filling. An



appropriate management plan is recommended in order to restore boundary hedgerows as a protected habitat and as a wildlife corridor by creating a transitional habitat (Figure 1) including a 1.5m buffer of grassland to tall ruderal to scrub. A rotation where no more than half of the hedgerows on site are trimmed in any one year is considered appropriate, with longer rotations of up to three-yearly cuts providing even greater wildlife value (Bright *et al.*, 2006). The value of the hedgerows could be further enhanced by allowing some trees to grow above the height of the surrounding hedge. In addition, portions of the hedgerows could be managed to prevent 'woody legs' to develop, whilst allowing the hedgerow to widen and develop a graduation into tall ruderal and long grass habitat. All planting should comprise of native species. A suitable and appropriate species planting list is provided in Appendix 14.

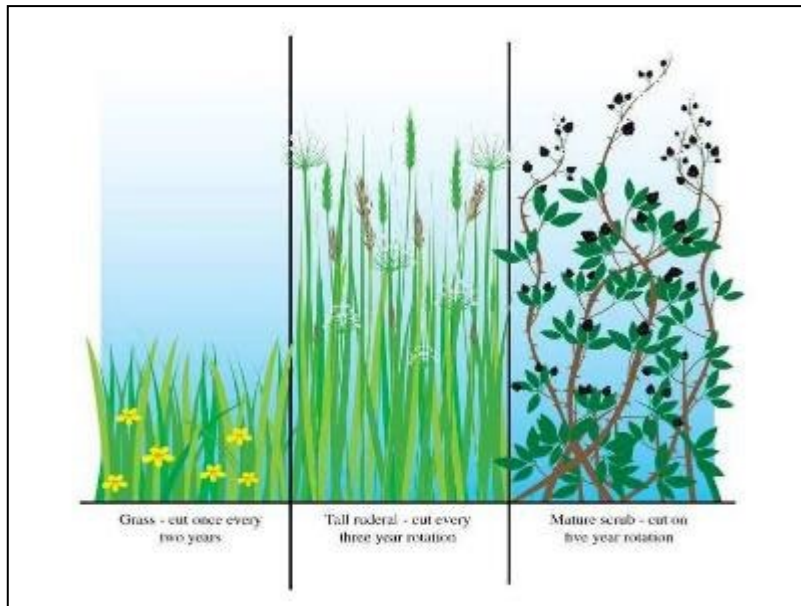
**4.24** The proposed works are not expected to have a direct impact on the Stansted Brook as works are not happening to the brook or its banks.

**4.25** Concerning indirect impacts, the following pollution prevention measures will likely mitigate risk to contamination of the adjacent River Cray both during construction and operational phases of the works, though should a COSHH assessment be undertaken it will supersede these recommendations:

- Fuel, oil and chemicals will be stored in secure bunded facilities at least 10m away from watercourses and drains;
- A designated area for washing out of concrete wagons, shoots and mortar bins will be provided.
- Suitable protection for watercourses potentially affected by the works will be installed prior to works commencing and these systems will be subsequently monitored.
- Dust levels are not expected to be problematic as most construction activities will take place some distance from the vegetation that forms the site boundary. However, under dry conditions dust suppression will be carried out.
- Planting of EM10 grassland mix with high growing wildflowers between the housing and the vegetation along the bank of the brook which can absorb herbicide if usage is implemented on the public open space.

**4.26** The inclusion of native planting within the development plan, together with retaining and enhancing boundary habitats where possible, buffering works from retained habitats, and managing the retained hedgerows on site through rotational cutting is predicted to result in a residual **positive** impact on habitats at a **site** level. It is advised that a recognised biodiversity metric calculator is utilised in order to ensure a measurable net gain for biodiversity is delivered.

**Figure 1: Edge Habitat Sketch**



### **Protected and notable species**

#### Flora

- 4.27** No invasive or protected species were observed on site. It is recommended that the current grazing schedule of the site is maintained to prevent any such notable species encroaching on to the site.
- 4.28** The proposed development and associated planting is anticipated to have a **positive** impact for the onsite flora at the **site** level.

#### Badgers

- 4.29** No evidence of badgers was found on site but the site does contain suitable sett building habitat. If works have not commenced after 12 months from the survey (24 February 2022), an update walkover should be carried out to inspect the site for any new signs of badgers. Should any new setts be discovered, they will need to be monitored to inform further mitigation. If found to be active, sett(s) will need to be closed under licence from Natural England between 1 July and 30 November.
- 4.30** It is recommended that general precautionary methods that are sympathetic to badgers are undertaken:
- Covering trenches at night or leaving a plank of wood leant against the side to ensure badgers can escape if they were to accidentally fall in;
  - Covering open pipework with a diameter of greater than 120mm at the end of the work day to prevent animals from entering and becoming trapped;
  - Covering chemicals and appropriately storing them overnight; and
  - Regular removal of litter.
  - Low speed limits ( $\leq 20$ mph).

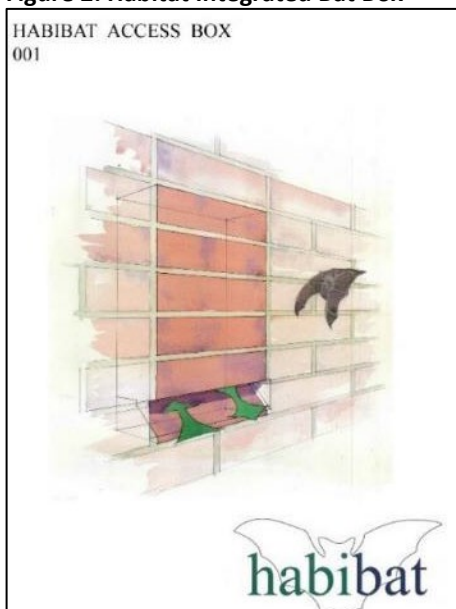
- 4.31** The site will be enhanced for badgers through the planting of species known to benefit wildlife (see Appendix 14) such as native fruit trees via the proposed orchard on site and the creation of species-rich grasslands. The proposed orchard will improve foraging and commuting potential for badgers.
- 4.32** The above mitigation and enhancement measures are considered to result in a **positive** residual effect at **site** level.

### Bats

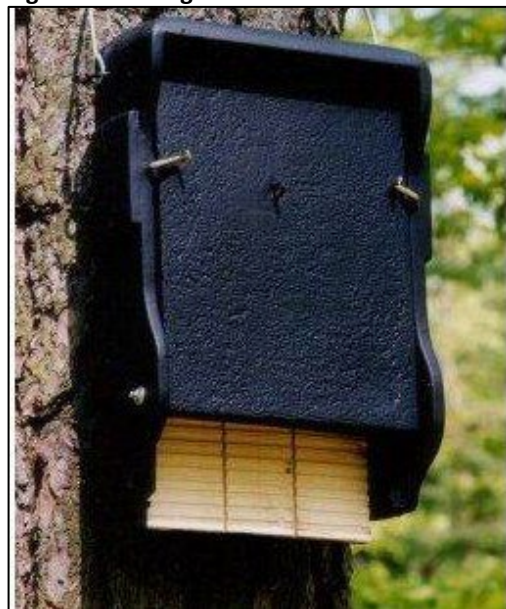
#### *Bats – Roosting*

- 4.33** Two trees on site with potential roost features are close to the site boundary and according to current plans are not due to be impacted by the development.
- 4.34** In the event that the trees require removal, climbing surveys are advised to inform the further survey and mitigation requirements. In the event the trees suitability for roosting bats is considered low, the tree can be soft felled. Should the suitability be assessed as moderate or high, emergence/re-entry surveys will be required to inform mitigation requirements. These are carried from May to September inclusive, emergence surveys are carried out 15 minutes before to one and a half hours after dusk and re-entry surveys are carried out one and a half hours before dawn to 15 minutes after sunrise.
- 4.35** The site could be enhanced for roosting bats through the inclusion of bat boxes within/attach to the proposed building and retained trees (away from artificial light). There are numerous bat box designs, however, two examples are shown in Figures 2 and 3. These have been selected as they require little to no maintenance after installation and can be installed at any point in the year.

**Figure 2: Habitat Integrated Bat Box**



**Figure 3: Schwegler 1FF Bat Box**



#### *Bats – Foraging and Commuting*

- 4.36** Suitable habitat on site will be retained as much as possible. Retained habitats will be enhanced with through additionally planting of species beneficial to bats, as detailed in Appendix 14.

**4.37** Where lighting is necessary, there are a number of ways to minimise the effect of lighting on bats. The following mitigation strategies have been taken from the Institution of Lighting Professionals and Bat Conservation Trust's Guidance Note 08/18 Bats and artificial lighting in the UK (2018) and other referenced sources:

- In general, light sources should not emit ultra-violet light to avoid attracting insects and thus potentially reducing numbers in adjacent areas, which bats may use for foraging. Metal halide and fluorescent sources should not be used.
- LED luminaires should be used where possible. A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light components. Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).
- Limiting the height of lighting columns to eight metres and increasing the spacing of lighting columns (Fure, 2006) can reduce spill of light into unwanted areas such as the retained woodland and hedgerow boundary habitats. Only luminaires with an upward light ratio of 0% and with good optical control should be used. Luminaires should always be mounted on the horizontal, i.e. no upward tilt.
- Other ways to reduce light spill include the use of directional luminaires, shields, baffles and/or louvres. Flat, cut-off lanterns are best. Additionally, lights should be located away from reflective surfaces where the reflection of light will spill onto potential foraging/commuting corridors. Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill. Where windows and glass facades etc. cannot be avoided, low transmission glazing treatments may be a suitable option in achieving reduced illuminance targets.
- Lighting that is required for security or access should use a lamp of no greater than 2000 lumens (150 Watts) and be PIR sensor activated on a short timer (1 minute), to ensure that the lights are only on when required and turned off when not in use (Jones, 2000; Hundt, 2012). A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

**4.38** The site will be enhanced through the inclusion of plant species known to benefit bats and wildlife in general (Appendix 14) and creation of transitional habitat adjacent to retained and/or created hedgerows. The proposed orchard will improve foraging potential through attracting invertebrates as well as commuting habitats through the creation of boundary features.

**4.39** The above mitigation and enhancement recommendations would likely result in a **positive** residual effect at **site** level for roosting, foraging and commuting bats.

#### Birds

**4.40** Two red, seven amber and 24 green listed species have been identified on site to date. Where the data is available, the number of territories recorded during survey is compared to the species regional and national status. National and regional status is derived from the reports of the Rare Breeding Birds Panel (RBBP), where appropriate (Holling et al., 2012).

**4.41** Any breeding population identified within the survey area is considered to be of national importance if it exceeded 1% of the national population. No breeding population of any species within the survey

area approaches the 1% level of the national population and given the size of the site it is unlikely that on site populations will reach this level.

- 4.42** One species, red kite *Milvus milvus*, protected under Schedule 1 of The Wildlife and Countryside Act 1981 was recorded visiting but not nesting on site . Given the scale of site, it is unlikely a significant population of Schedule 1 birds will be found on site, and similar habitat is available in the surrounding environment. In the event that one is found, an appropriate nest box will be installed to offset the lost nesting habitat.
- 4.43** Although a total of 15 species were recorded as breeding within the survey boundary as a whole only, a limited number of these are likely to be affected by proposals given the nesting habitat is restricted to the site boundaries and retained trees.
- 4.44** Where possible, habitat creation of similar ecological value to that currently present should also be included within the site-wide landscaping plan. This will ensure that any habitat loss during construction is mitigated for and will have the objective of conserving the assemblage of breeding bird's dependent on the survey area. The boundary habitats will be retained and enhanced where possible to mitigate for the reduction in bird nesting opportunities. New areas of dense scrub or native thicket will be created to encourage species such as song thrush and wren. Habitat creation, enhancement, and long-term management measures will target BoCC species known to occur within the local area.
- 4.45** To avoid direct impacts on breeding birds within the development boundary during construction, it is recommended that any clearance of vegetation is undertaken outside of the breeding season. Typically, for the majority of breeding bird species, this is considered as being March to August inclusive.
- 4.46** To comply with current legislation and avoid nest destruction, vegetation clearance works affecting nesting habitat (including hedgerows, trees, scrub and tall grasses/ruderals) will be scheduled so that these do not occur during the bird breeding season (i.e. outside the period March-August inclusive). If this is not possible, a check will be carried out by a suitably qualified ecologist no more than 48 hours in advance of clearance works. If an active birds' nest is found within the proposed clearance zone, suitable avoidance measures will be installed, such as creating a buffer zone with barrier tape around the nest to ensure that the nest is not damaged or destroyed by the works. The nest will then be monitored until all chicks have fledged and a suitably experienced ecologist confirms the nest is now inactive and works can safely proceed.
- 4.47** Where possible, planting of native bushes, including common hawthorn and blackthorn that produce autumn crops of fruit would be beneficial. This will promote the continued use of the site throughout the year by the majority of bird species recorded during the survey, providing foraging, roosting and breeding habitat in the summer months, along with foraging and roosting habitat in the winter months.
- 4.48** It will take time for newly-planted areas to become established and develop into potential bird nesting habitat, and artificial bird-nesting features or boxes should be installed on site to provide additional nesting sites, targeting BoCC species such as swift *Apus apus*, house sparrow and starling. The following boxes (or similar) will be installed:

- 5 x small hole (6 x 26mm, 6 x 28mm and 6 x 32mm) boxes placed throughout the site on suitable trees and buildings will provide nesting opportunities for small passerines such as blue tit and great tit.
- 10 x small open fronted nest boxes should be placed on trees with ivy to provides cover/shelter from predators. These boxes typically attract robin, blackbird and wren.
- 5 x sparrow terrace *Passer domesticus* on buildings under the eaves facing areas of open space.
- 10 x swift *Apus apus* brick will be placed on or built into suitable buildings throughout the development.

**4.49** The planned orchard will improve the foraging potential of the site for birds as well as provide additional nesting habitat for tree nesting species.

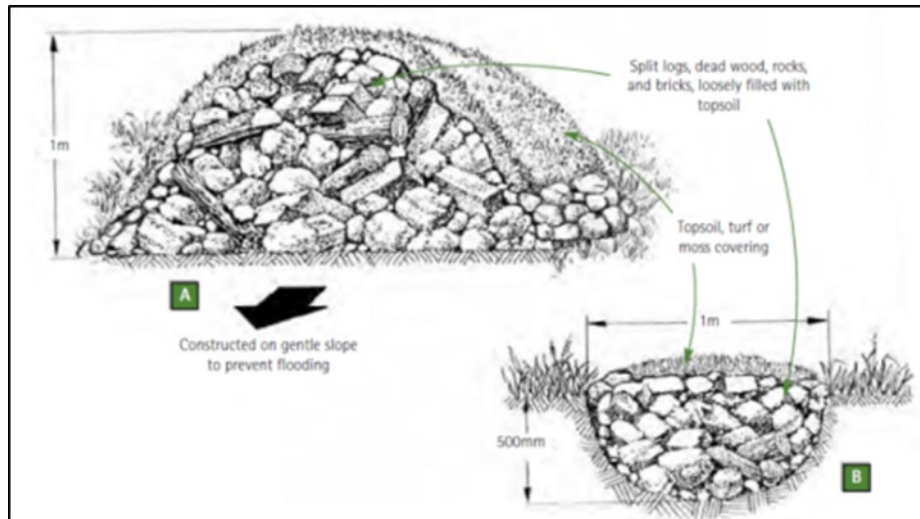
**4.50** Provide the above mitigation is followed it is expected that the development would result in a **positive** impacts on breeding birds, confidence in this assessment is high.

### Reptiles

**4.51** The field boundaries offered limited opportunities for reptiles whilst the improved grassland was unsuitable. It is recommended that the current site maintenance is maintained until commencement in order to prevent the site becoming more suitable for reptiles.

**4.52** The site could be enhanced for reptiles through the creation of log piles and hibernacula (Figure 5). Additionally the proposed orchard will improve foraging and hibernation habitat on site.

**Figure 4: Hibernacula Design**



**4.53** Given the characteristics of the site, mitigation is considered to be fully achievable through the proposed layout. The above mitigation and enhancement recommendations would likely result in a **positive** residual effect at **site** level.

### Invertebrates

4.54 The site could be enhanced for invertebrates through habitat creation with planting of flora known to be favoured by invertebrate species (Appendix 14). This will be facilitated by the proposed orchard and species rich grasslands.

4.55 The above enhancement recommendations would likely result in a **positive** residual effect at site level.

### Other Notable Species

4.56 The boundary hedgerows are considered to be suitable for hedgehogs, polecat and common toad. These habitats should be retained but if clearance is required, it is recommended this is undertaken outside the hibernation season (November to February inclusive) when hedgehogs are most vulnerable. If this is not possible, it is recommended that clearance and ground works are undertaken under a method statement which details precautionary measures supervised by an SQE.

4.57 To retain hedgehog access into the site post-development it is recommended that hedgehog highways are added to fences by creating regular 13cm x 13cm holes in fencing/walls. This size gap is too small for most pets and can be undertaken by raising a fence panel per garden. Hedgehog highways can be created by installing hedgehog friendly fencing, removing a brick at the bottom of a wall or cutting a hole in fencing. An example of such a gap is provided in Figure 6. Regular dropped curbs will protect hedgehogs from road collisions. Measures to protect badgers, including low speed limits, will further serve to protect hedgehogs during the operational stage of the development. Furthermore, the installation of hibernacula and use of native, species-rich seed mixes in informal areas and SUDs systems will provide suitable foraging habitat for this species.

Figure 5: Hedgehog Highway Example



4.58 Measures outlined above pertaining to the creation of low-speed limits, gap-filling of hedgerows, use of plants offering a value to wildlife and creation of hibernacula and sensitive lighting will serve to enhance the site for hedgehogs, and toad. This is considered to result in a **positive** residual effect at **site** level.

## 5.0 Conclusions

5.1 A summary of likely impacts, mitigation and enhancements proposed is provided in Table 8. Where further surveys are required, the rows are highlighted blue. Through the above mitigation including sensitive layout design (retaining boundary habitats where possible), a wildlife friendly landscaping scheme, sensitive practices/management during construction and occupation and precautionary methods as suggested, it is considered that all significant impacts on biodiversity, including any potential adverse impacts upon specific protected species and habitats will likely be able to be wholly mitigated in line with relevant wildlife legislation, chapter 15 of the NPPF (MHCLG, 2019); and adopted and emerging local plan policies with regard to biodiversity.

**Table 12: Summary of Likely Impacts, Mitigation, Enhancement Measures and Residual Impacts**

Feature	Likely Impacts	Mitigation and Enhancement Measures	Further Survey Requirement	Likely Residual Impact
Internationally Designated Sites	N/A	N/A	N/A	Neutral
Nationally Designated Sites	Increased recreational pressure  Air quality	Financial contribution to Hatfield Forest SSSI strategy  Provision of semi natural open space  Linkages to offsite PRoW  Financial contribution to the management of Elsenham woods SSSI (to be agreed with Natural England)	N/A	Neutral
Habitats	Damage to retained boundary habitats and HoPI.	Use of native species and species offering a value to wildlife across the site  Pollution prevention to industry best practice standards.  Protection of boundary habitats including retained trees, tall ruderal and hedgerows using heras fencing and signage.  Creation of semi natural habitats such as species rich grassland, hedgerows, ponds and species rich scrub. Achieved through the use of native, species-rich plants and seed mixes which offer a benefit to wildlife.	N/A	Positive
Badgers	Death/injury during construction (if present)	Standard precautionary measures (see 4.13). Planting species of known wildlife benefit.	Pre-construction badger survey if works begin after February 2023.	Positive



Feature	Likely Impacts	Mitigation and Enhancement Measures	Further Survey Requirement	Likely Residual Impact
Bats - Roosting	Death/injury during construction (if present)	Provision of bat boxes and planting species of known wildlife benefit. If plans change to impact prf trees, further surveys will be required to inform mitigation.	Climbing surveys if trees with suitability are to be impacted.	Positive
Bats – Foraging/ Commuting	Disturbance and predation	Retention of boundary habitats and avoidance of light spill. Sensitive lighting strategy. Planting species of benefit to bats.	N/A	Positive
Birds	Loss of habitat	Habitat to be removed outside bird nesting season (March to August inclusive) or once an ecologist has checked and confirmed absence of active nests. Bird boxes to be installed on retained trees and within the fabric of the new building respectively. Habitat creation including grassland, scrub, trees, shrubs and plants which offer a value to nesting and foraging birds within the soft-landscaping plans.	N/A	Positive
Common reptiles	Death/injury (if present)	Upkeep of the current grazing scheme to ensure the site remains largely unsuitable for reptiles. Provision of hibernacula and log piles, habitat creation such as grassland , scrub, orchard and ponds using species-rich seed mixes and use of plants offering a value to wildlife.	N/A	Positive
Hedgehog, polecat and toad	Death/injury (if present)	As for badger and reptile mitigation, to include precautionary measures and clearance of sensitive habitats by hand. Enhancements include the provision of hedgehog gaps and a hedgehog highway in fence lines and the provision of log piles and hibernacula.	N/A	Positive

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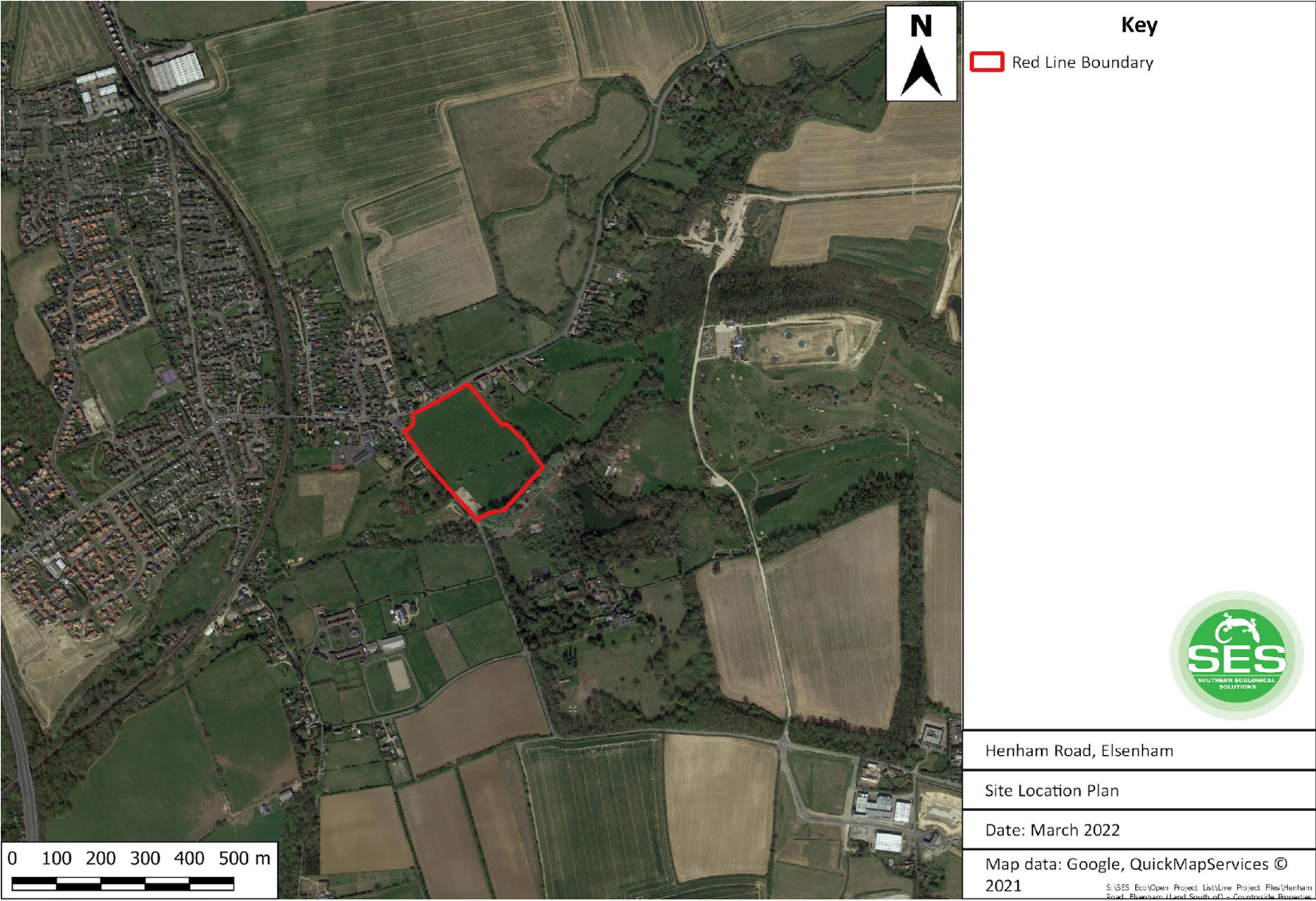
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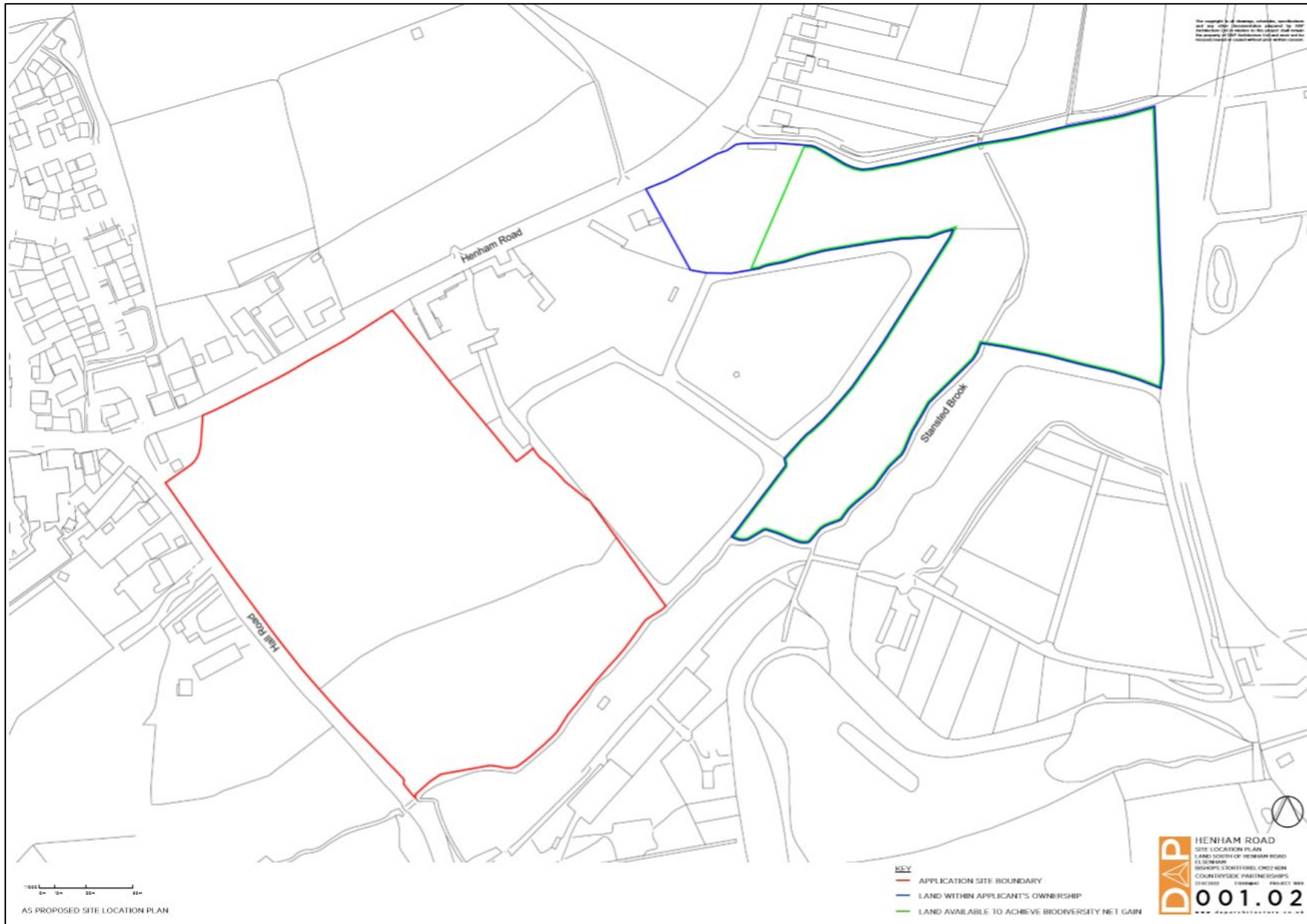
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**Appendix 1: Site Location Plans**

*Appendix 1a: Site Location Plan*



Appendix 1b: Site Location Plan and Offsite Biodiversity Net Gain site



**Appendix 2: Proposed Site Layout**



### **Appendix 3: Legislative and Policy Framework**

This document has not been prepared by a legal or planning professional and should be read as an interpretation of relevant statutes and planning policy guidance only. The information presented within this document has been reported in good faith and are the genuine opinion of SES on such matters. SES does not accept any liability resulting from outcomes relating to the use of this information or its interpretation within this document.

#### **National Planning Policy**

The NPPF (MHCLG, 2021) states that:

##### **Paragraph 174**

Planning policies and decisions should contribute to and enhance the natural and local environment by:

- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
- c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;
- d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

##### **Paragraph 180**

When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

## **Local Planning Policy**

The policies related to nature conservation published by Uttlesford District Council (Adopted 2005) are set out below.

### Policy ENV1 – Design of Development within Conservation Areas

Development will be permitted where it preserves or enhances the character and appearance of the essential features of a Conservation Area, including plan form, relationship between buildings, the arrangement of open areas and their enclosure, grain or significant natural or heritage features. Outline applications will not be considered. Development involving the demolition of a structure which positively contributes to the character and appearance of the area will not be permitted.

### Policy ENV3 – Open Spaces and Trees

The loss of traditional open spaces, other visually important spaces, groups of trees and fine individual tree specimens through development proposals will not be permitted unless the need for the development outweighs their amenity value.

### Policy ENV5 – Protection of Agricultural Land

Development of the best and most versatile agricultural land will only be permitted where opportunities have been assessed for accommodating development on previously developed sites or within existing development limits. Where development of agricultural land is required, developers should seek to use areas of poorer quality except where other sustainability considerations suggest otherwise.

### Policy ENV7 – The Protection of the Natural Environment – Designated Sites

Development proposals that adversely affect areas of nationally important nature conservation concern, such as Sites of Special Scientific Interest and National Nature Reserves, will not be permitted unless the need for the development outweighs the particular importance of the nature conservation value of site or reserve.

Development proposals likely to affect local areas of nature conservation significance, such as County Wildlife sites, ancient woodlands, wildlife habitats, sites of ecological interest and Regionally Important Geological/ Geomorphological Sites, will not be permitted unless the need for the development outweighs the local significance of the site to the biodiversity of the District. Where development is permitted the authority will consider the use of conditions or planning obligations to ensure the protection and enhancement of the site's conservation interest.

### Policy ENV8 – Other Landscape Elements of Importance for Nature Conservation

Development that may adversely affect these landscape elements



Hedgerows/Linear tree belts/Larger semi natural or ancient woodlands/Semi-natural grasslands/Green lanes and special verges/Orchards /Plantations/Ponds reservoirs/River corridors/Linear wetland features/Networks or patterns of other locally important habitats. will only be permitted if the following criteria apply:

- a) The need for the development outweighs the need to retain the elements for their importance to wild fauna and flora;
- b) Mitigation measures are provided that would compensate for the harm and reinstate the nature conservation value of the locality.

Appropriate management of these elements will be encouraged through the use of conditions and planning obligations

### **Wildlife Legislation**

The two principal wildlife statutes are the Conservation of Habitats and Species Regulations (Habitats Regulations, 2019) and the Wildlife and Countryside Act (WCA, 1981) that both deal with nationally important sites and species.

Selected habitat and species features within discrete sites are protected as Sites of Special Scientific Interest (SSSI) under the WCA 1981.

Selected SSSI are more strictly protected as proposed or designated Special Protection Areas (SPA), Special Areas of Conservation (SAC) under the Conservation of Habitats and Species Regulations (2019). Ramsar sites are no longer part of the UK site network but remain designated under the Ramsar Convention and protected under the Habitat Regulations (2019).

The Habitats Regulations, 2019 protect features and resources listed as being of national importance from both direct and indirect effects arising from a range of likely significant effects including proposed development. Development proposals remain subject to the Habitats Regulations Assessment (HRA) process and especially the sequential Screening and Appropriate Assessment tests.

Local Nature Reserves (LNR) are designated by Local Planning Authorities and protected under the National Parks and Access to the Countryside Act, (1949) Section 21.

Certain species listed on Schedule 5 of the WCA 1981, including all bat species, great crested newt *Triturus cristatus*, hazel dormouse *Muscardinus avellanarius* and otter *Lutra lutra* are also protected under Schedule 2 of the Habitats Regulations 2010. Taken together it is illegal to:

- Deliberately kill, injure or capture any wild animal under Schedule 2;
- Deliberately disturb wild animals of any EPS in such a way to be likely to significantly affect:
- The ability of any significant groups of animals of that species to survive, breed, rear or nurture their young; or
- The local distribution of that species.
- Recklessly disturb an Schedule 2 species or obstruct access to their place of rest;
- Damage or destroy breeding sites or resting places of such animals;
- Deliberately take or destroy the eggs of such an animal;
- Possess or transport any part of an Schedule 2 species, unless acquired legally; and/or

- Sell, barter or exchange any part of an Schedule 2 species.

A range of species other than birds, including water vole *Arvicola amphibius*, are protected from disturbance and destruction under the WCA 1981 through inclusion on Schedule 5.

All breeding birds are protected from deliberate destruction under the WCA 1981. Certain species are further protected from disturbance at their nest sites being listed on Schedule 1 of the WCA 1981.

Common reptiles including common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix helvetica* and adder *Vipera berus* are protected under the WCA 1981, they are listed as schedule 5 species, therefore part of Section 9(1) and section 9(5) apply; the Countryside and Rights of Way Act 2000 (CRoW) also strengthens their protection.

Badger *Meles meles* is protected from sett disturbance and destruction under the Protection of Badgers Act 1992.

Section 40 of The Natural Environment and Rural Communities Act (NERC) 2006 places a legal duty on Local Authorities to conserve biodiversity. Section 41 (S41) sets out a list of 943 species and habitats of principal importance. These species are known as England Biodiversity Priority (EBP) species and are those identified as requiring action under the former UK Biodiversity Action Plan (BAP) and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework.

Native, species-rich hedgerows that fit certain criteria are protected as being 'important' under the Hedgerow Regulations (1997).

Japanese Knotweed *Fallopia japonica*, along with other introduced and invasive species are listed under Schedule 9 of the WCA 1981. Japanese knotweed is highly invasive and its rhizomes cause damage to built structures. Hence it is also classed as controlled waste under the Environment Protection Act 1990 and has therefore either to be removed or disposed of in a licensed landfill or the rhizomes buried to a depth of at least 5m.

## **Appendix 4: Detailed Methods**

### **Extended Phase 1 Habitat Survey**

Phase 1 Habitat Survey is a standard technique for obtaining baseline ecological information for areas of land, including proposed development sites. Phase 1 Habitat Survey methods are set out in the Handbook for Phase 1 Habitat Survey (Joint Nature Conservation Committee, 2010). Habitat mapping was undertaken using the standard classification to indicate habitat types. Features of ecological interest and value were highlighted using target notes.

### **Detailed Botanical Survey**

As the Phase 1 Habitat Survey was conducted during sub-optimal timings for botanical survey, a further site visit was undertaken in May 2019 to assess the floristic value of the site and compile a peak-season detailed botanical species list.

Plant species identified in each of the various habitat parcels were recorded and their abundances assessed on the DAFOR scale:

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

These scores represent the abundance within the defined area only and do not reflect national or regional abundances. Plant species nomenclature follows Stace (2010).

### **Bats**

#### **Preliminary Assessment**

Habitats on and adjacent site were assessed for their suitability to support roosting, foraging and commuting bats using guidelines issued by the Bat Conservation Trust (Collins, 2016). All potential roosting habitats (existing trees) were assigned a level of suitability according to the descriptions outlined in Table A3.1. Trees were initially assessed from ground level, using binoculars where necessary to identify potential roost features, bat access points and evidence of bat occupation such as droppings, urine staining and mammalian fur oil staining.

The site was also assigned a level of suitability for foraging and commuting bats according to the descriptions outlined in Table A3.1.

**Table A3.1. Assessment of the potential suitability of a proposed development site for roosting, foraging and commuting bats (Collins, 2016)**

Suitability	Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats	Negligible habitat features on site likely to be used by commuting and foraging bats
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically but not enough space, shelter, protection and appropriate conditions to be used on a regular basis or by larger numbers of bats</p> <p>A tree of sufficient size and age to contain potential roosting features but with none seen from the ground or features seen with only very limited roosting potential</p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat</p> <p>Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or patch of scrub</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge</p> <p>High-quality habitat that is well-connected to the wider landscape that is likely used regularly by foraging bats such as broad-leaved woodland, tree-lined watercourses and grazed parkland</p> <p>Site is close to and connected to known roosts</p>

## Great Crested Newt

### Habitat Suitability Index

The HSI for the great crested newt was developed by Oldham et al (2000). An HSI is a numerical index, between 0 and 1. 0 indicates unsuitable habitat, 1 represents optimal habitat. The HSI for the great crested newt incorporates 10 suitability indices, all of which are factors thought to influence the likelihood of great crested newt presence (*e.g.* surrounding habitat, geographical location, shading, presence of waterfowl and fish).

The HSI is calculated as a geometric mean of the 10 suitability indices (SI) as indicated below:

- Geographic locality
- Pond area
- Permanence
- Water quality
- Shade
- Waterfowl presence
- Fish presence
- Pond count within 1km<sup>2</sup> of survey pond
- Terrestrial habitat quality
- Macrophyte cover

$$\text{HSI} = (\text{SI1} \times \text{SI2} \times \text{SI3} \times \text{SI4} \times \text{SI5} \times \text{SI6} \times \text{SI7} \times \text{SI8} \times \text{SI9} \times \text{SI10})^{1/10}$$

The data regarding each factor is collected in the field at each pond and also by using maps, this is then converted into SI scores on a scale of 0.1 - 1.0. The results can then be used to calculate the HSI. In general ponds with high HSI scores are more likely to support great crested newts than those with low scores.

**Table A3.4 HSI score categories (Oldham *et al.*, 2000)**

HSI score	Pond suitability
< 0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

The HSI for great crested newt is a measure of habitat suitability. It is not a substitute for newt surveys. In general, ponds with high HSI scores are more likely to support great crested newt than those with low scores. However, the system is not sufficiently precise to allow the conclusion that any particular pond with a high score will support newts, or that any pond with a low score will not do so. There is also a positive correlation between HSI scores and the numbers of great crested newt observed in ponds. So, in general, high HSI scores are likely to be associated with greater numbers of great crested newt. The relationship however is not sufficiently strong to allow predictions to be made about the numbers of newts in any particular pond. HSI scoring of ponds can be useful when:

- Evaluating the general suitability of a pond or group of ponds to support great crested newt;
- Comparing ponds across different areas of a site or within the landscape;
- Evaluating the suitability of ponds to be used as receptor sites for great crested newt;
- Planning restorative or enhancement works to ponds.

Lee Brady developed a system of using HSI scores to define ponds suitability for great crested newts on a categorical scale during a study undertaken in south-east England in which 248 ponds were surveyed for great crested newt using standard methods and also subjected to an HSI. The results of this study show that as the HSI score increases, the proportion of ponds occupied also increases, as summarised below:

**Table A3.5 HSI range, associated suitability and predicted probability of presence.**

HSI Range	Pond Suitability	Predicted presence of great crested newt (% of ponds occupied n=248)
<0.5	Poor	0.03
0.5 - 0.59	Below average	0.2
0.6-0.69	Average	0.55
0.7-0.79	Good	0.79

### **Badgers**

Surveys were carried out using standard guidelines for classifying badger setts (Harris *et al.*, 1989) and categorising entrance holes (Natural England, 2009). All areas of the site and wider area readily accessible except private residential properties and patches of dense scrub.

The survey comprised a detailed systematic walkover survey of the site and known setts. Dense scrub was present on site and was accessed to a satisfactory degree. The badger signs looked for were:

- Additional holes/setts;
- Prints;
- Badger runs;
- Hairs;
- Latrines;
- Scratching posts, and;
- Snuffle marks.

The number of entrances and levels of use were recorded, and the sett was classified according to the criteria used in the National Badger surveys (Harris *et al.*, 1989). The classification criteria are given below:

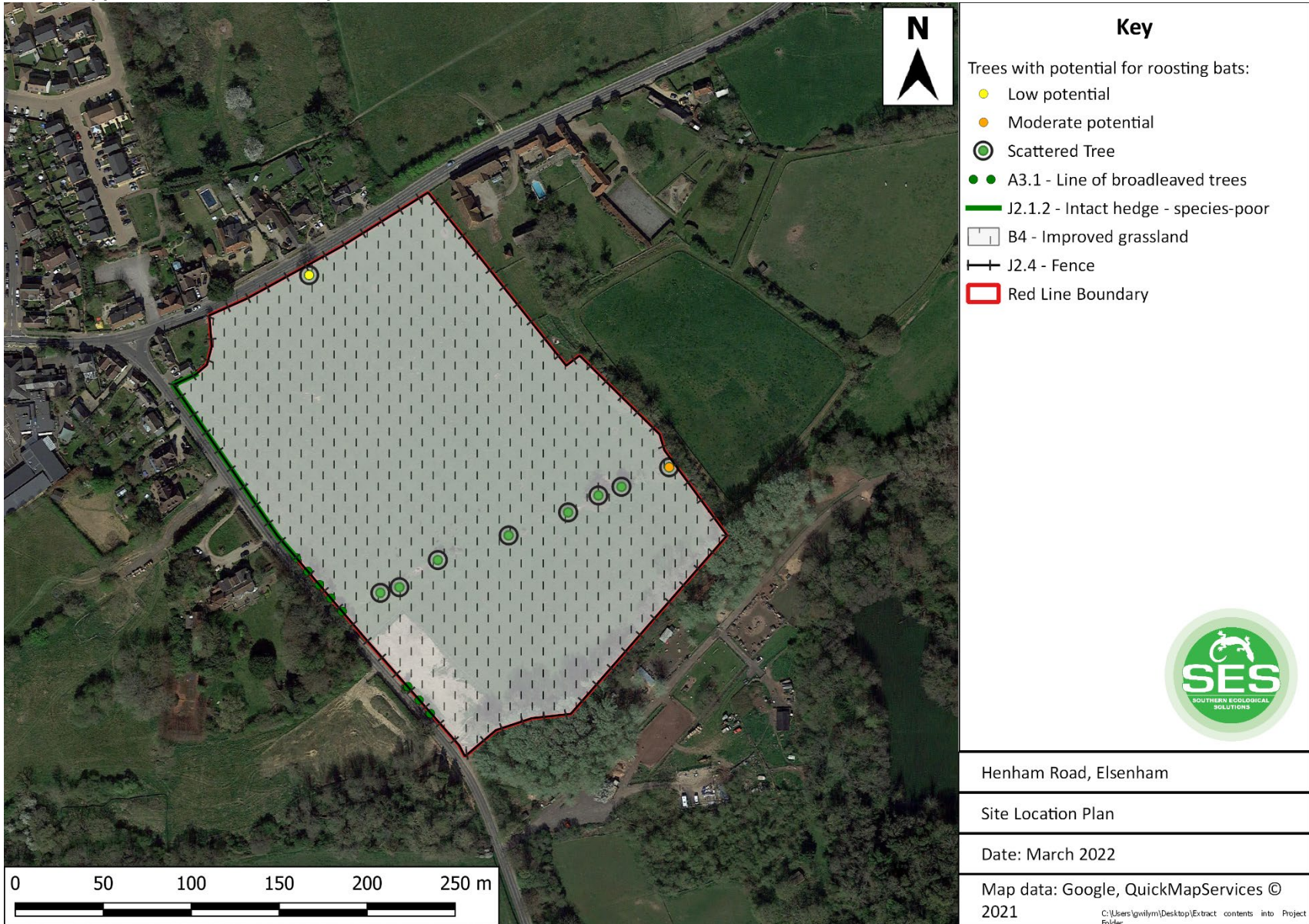
- Main setts – a large well established, often extensive and in continuous use. There is only one main sett per social group of badgers. This is where the cubs are most likely to be born.
- Annexe setts – occur in close association with the main sett and are linked to the main sett by clear well-used paths. If a second litter of cubs are born, they will be reared here.
- Subsidiary setts – these often have 3-5 holes and are normally over 50m from a main sett and are not linked by clear paths. These setts are not continually active.
- Outlying setts – these usually have 1-3 holes, have small spoil heaps and are sporadically used. Foxes and rabbits may move in.

An assessment of the activity of each sett was undertaken; the following categories were assigned to the entrance holes to make this assessment:

- Well-used: Entrances clear of debris and vegetation and are obviously well used.
- Partially-used: Entrances are not in regular use and have debris such as leaves or twigs across the entrances. These holes could come into regular use with minimal clearance.
- Disused: Entrances have not been used for some time, are partially or completely blocked. There may be a depression in the ground where the hole used to be.

A badger sett is protected by legislation if it “displays signs indicating current use by a badger”. A sett is therefore protected if such signs remain present (Natural England, 2009). As such, a sett is likely to fall outside the definition of a sett in the Act if the evidence available indicates that it is not in current use by badgers; e.g. absence of badger field signs, debris in sett entrances etc.

**Appendix 5: Phase 1 Survey Plan**





**Appendix 6: Site Photographs**

**Photo 1: Horse paddock**



**Photo 2: Brook south of the site.**



**Photo 3: Bramble hedgerow on site.**



**Photo 4: Pond south of the site**



**Photo 5: Tree with moderate suitability for roosting bats**



**Photo 6: Tree with low suitability for roosting bats**

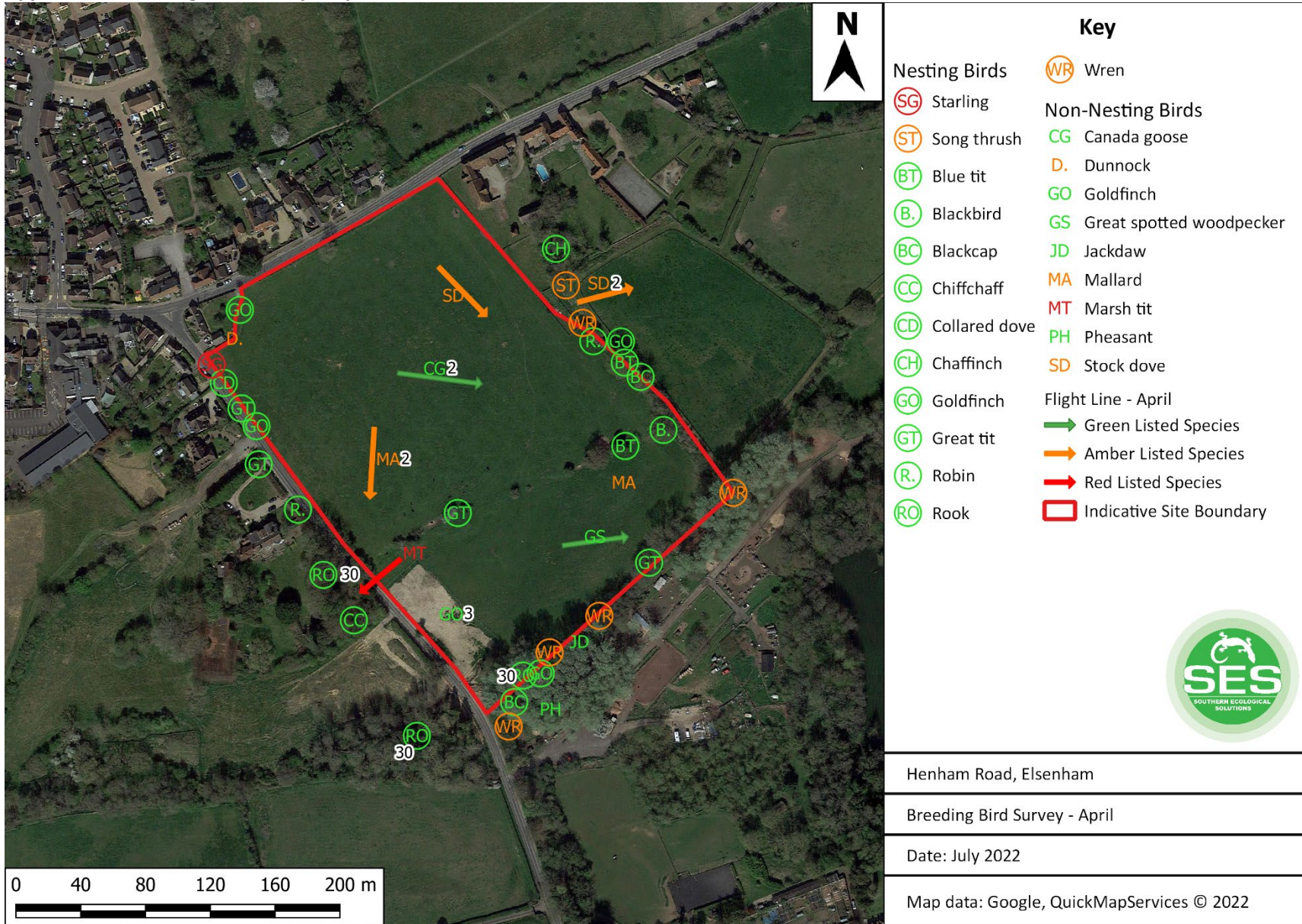


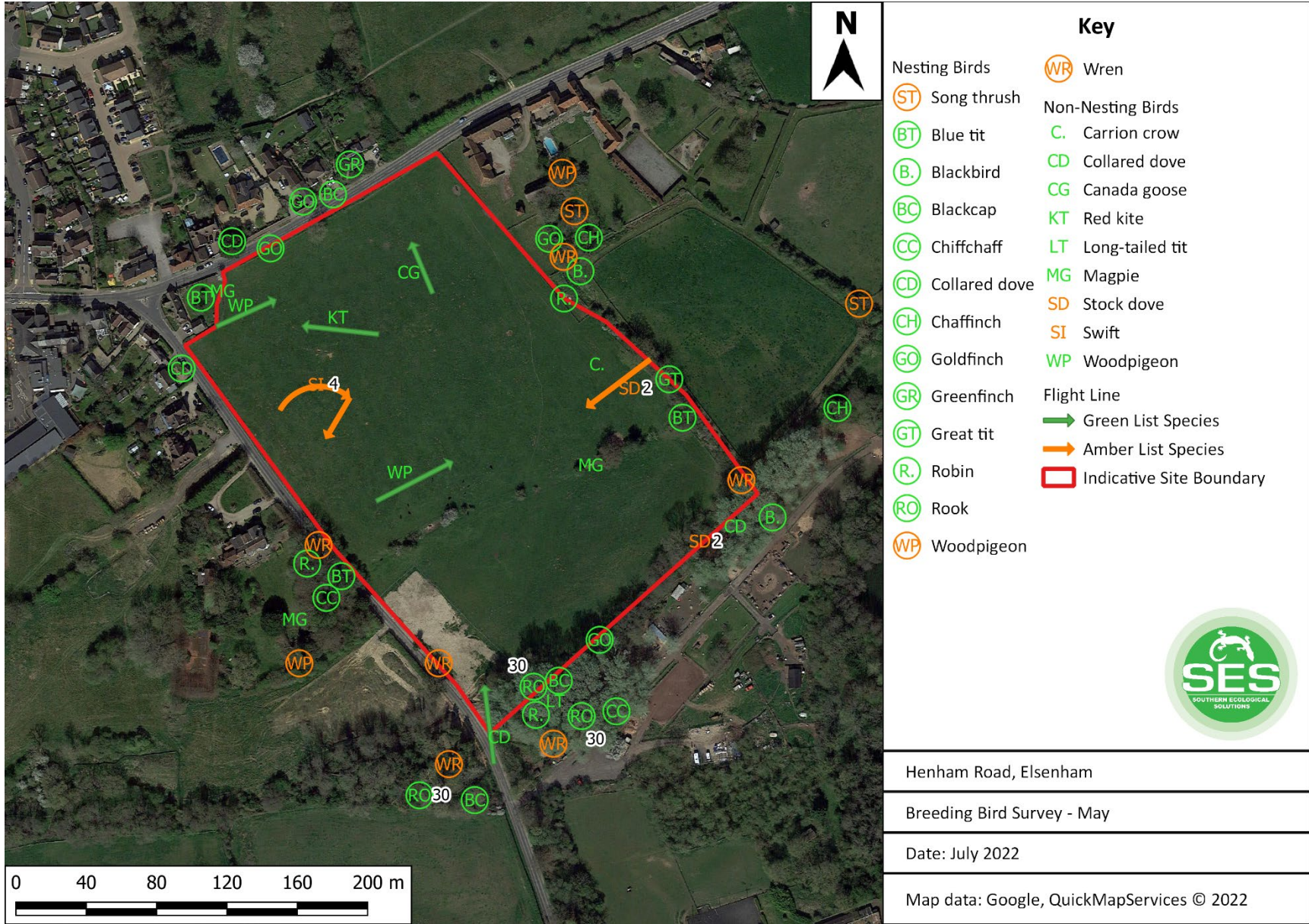
## Appendix 7: Botanical Species Lists

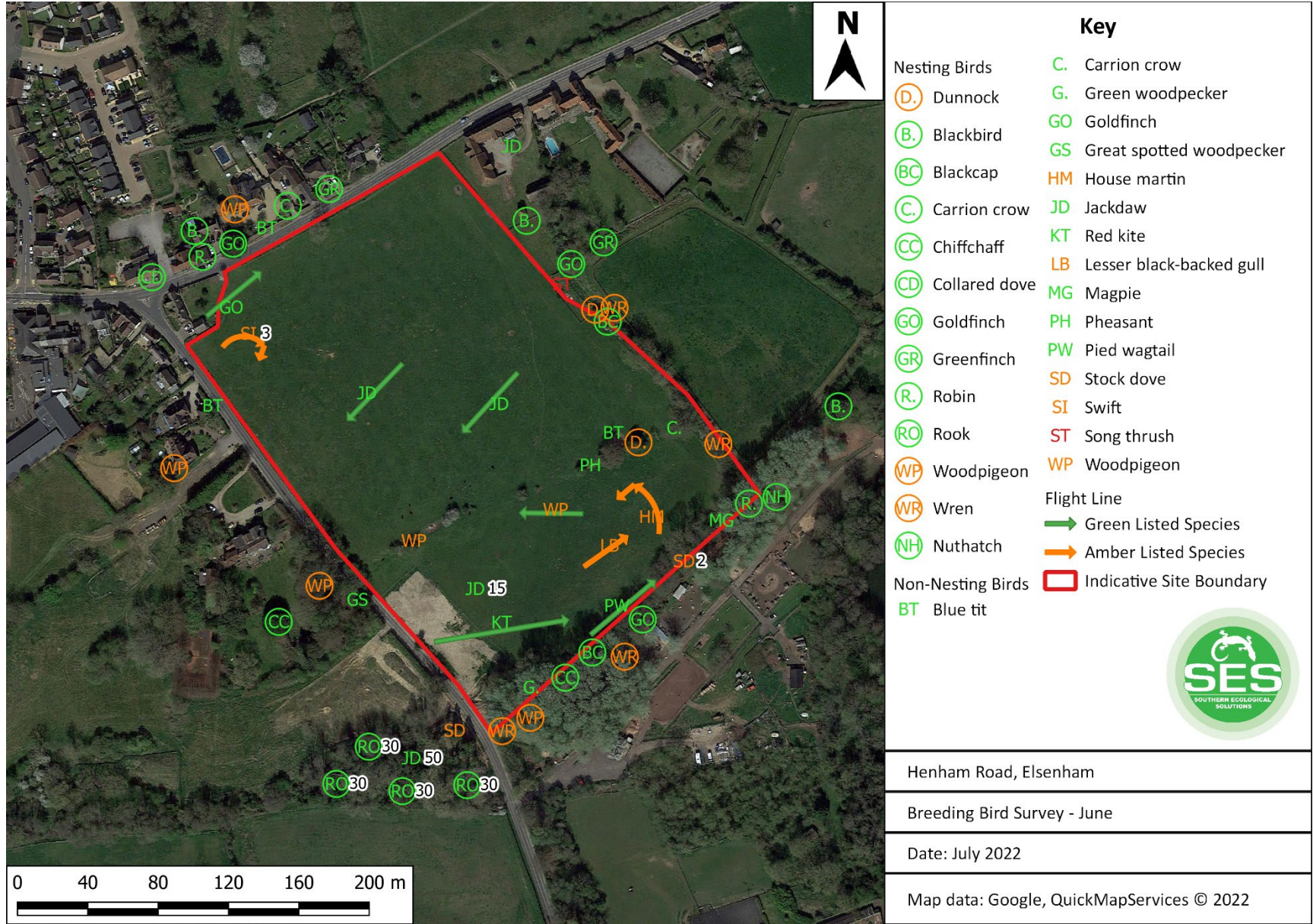
Table A6: Plant assemblages recorded during Phase 1 survey

Common name	Scientific name	Improved Grassland	Intact Species-Poor Hedgerow	Line of Trees/Scattered Trees
Alder	<i>Alnus glutinosa</i>			
Bramble	<i>Rubus fruticosus</i> agg.		D	
Beech	<i>Fagus sylvatica</i>			R
Common nettle	<i>Urtica dioica</i>	R	R	
Daffodil	<i>Narcissus pseudonarcissus</i>	R		
Grass sp.	<i>Poaceae</i> sp.	D		
Hawthorn	<i>Crataegus monogyna</i>			R
Holly	<i>Ilex aquifolium</i>			R
Common Ivy	<i>Hedera helix</i>			R
Oak	<i>Quercus rubra</i>			O
Snowdrop	<i>Galanthus nivalis</i>		R	
Spear Thistle	<i>Cirsium vulgare</i>		R	

Appendix 8: Breeding Bird Survey Maps







## Appendix 9: Breeding Bird Survey Results

### Appendix 9a – Breeding Bird Survey Results and Weather Conditions

Table A9.1: Status of Breeding birds within the site.

Species	BoCC	S. 41	V1	V2	V3
Starling <i>Sturnus vulgaris</i>	Red		1	0	0
Marsh Tit <i>Poecile palustris</i>	Red	✓	1	0	0
Dunnock <i>Prunella modularis</i>	Amber		1	2	0
Mallard <i>Anas platyrhynchos</i>	Amber		0	4	6
Song thrush <i>Turdus philomelos</i>	Amber		5	6	1
Stock dove <i>Columba oenas</i>	Amber		1	0	2
Swift <i>Apus apus</i>	Amber		3	0	0
Woodpigeon <i>Columba palumbus</i>	Amber		3	4	3
Wren <i>Troglodytes troglodytes</i>	Amber		0	4	3
Blackbird <i>Turdus merula</i>	Green		1	2	3
Blackcap <i>Sylvia atricapilla</i>	Green		2	3	2
Blue tit <i>Cyanistes caeruleus</i>	Green		2	3	3
Chiffchaff <i>Phylloscopus collybita</i>	Green		1	2	2
Collared dove <i>Streptopelia decaocto</i>	Green		1	4	1
Goldfinch <i>Carduelis carduelis</i>	Green		1	2	0
Great spotted woodpecker <i>Dendrocopos major</i>	Green		4	4	3
Great tit <i>Parus major</i>	Green		0	1	2
Green woodpecker <i>Picus viridis</i>	Green		4	1	0
Greenfinch <i>Chloris chloris</i>	Green		0	0	1
House martin <i>Delichon urbicum</i>	Green		2	3	2
Jackdaw <i>Corvus monedula</i>	Green		90	90	120
Lesser black-backed gull	Green		0	1	2
Long tailed tit <i>Aegithalos caudatus</i>	Green		2	1	0
Magpie <i>Pica pica</i>	Green		0	0	1
Nuthatch <i>Sitta europaea</i>	Green		1	0	1
Pied wagtail <i>Motacilla alba</i>	Green		1	0	1
Red kite <i>Milvus milvus</i>	Green		0	0	1
Robin <i>Erithacus rubecula</i>	Green		1	0	48
Rook <i>Corvus frugilegus</i>	Green		0	1	1
Pheasant <i>Phasianus colchicus</i>	Introduced		0	0	1

I Introduced

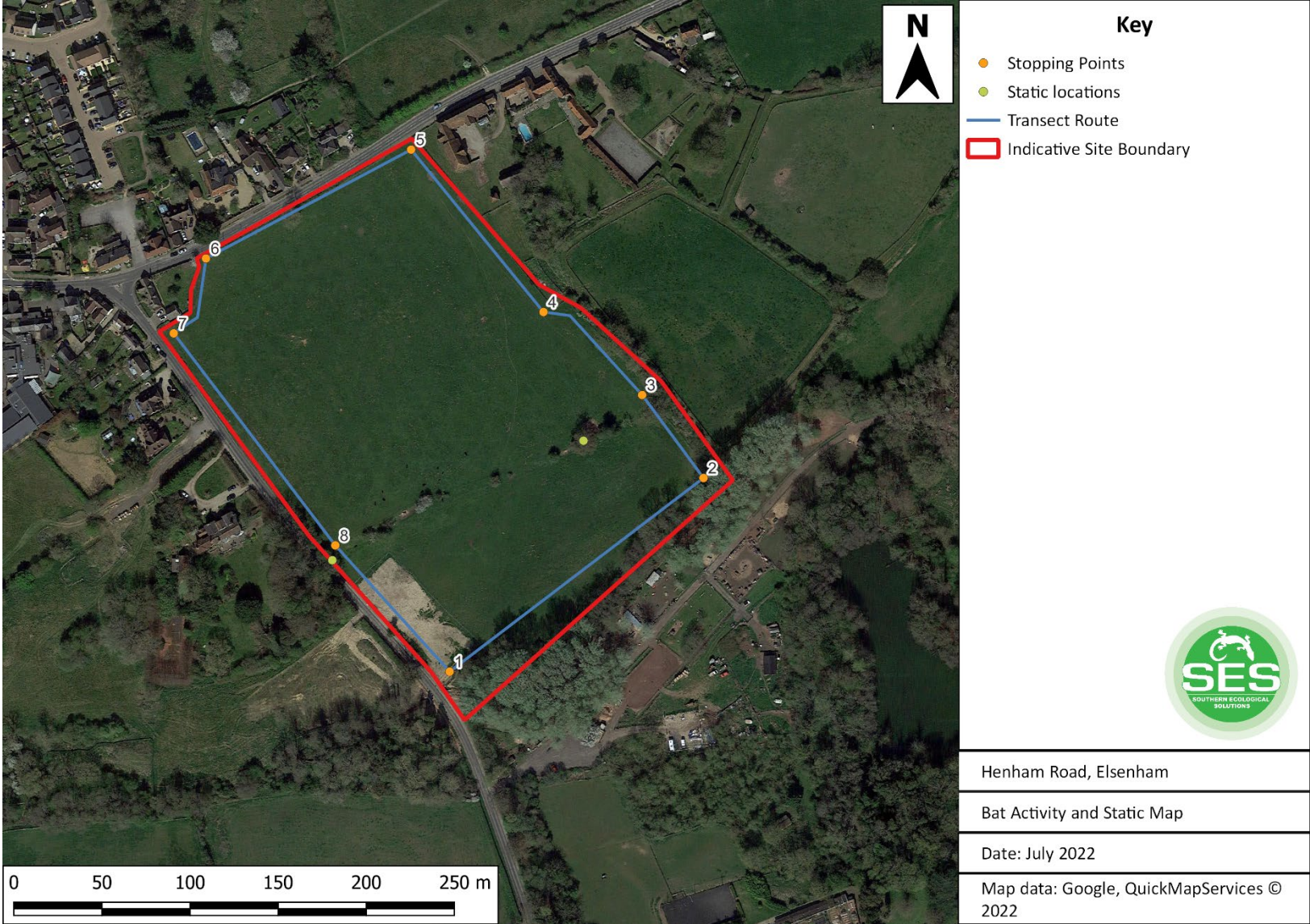
Red rows are BOCC red-list, Amber rows are BoCC amber-list, Green rows are BoCC green-list.

BoCC: Birds of Conservation Concern as defined and listed in Eaton *et al.*, (2015)

Table A9.2: Summary of breeding bird survey visit dates and weather conditions.

Visit	Date	Survey Conditions
1	24/02/2022	Fair: 8°C (average), dry, 2 wind, cloud 6/8, good visibility.
2	14/05/2022	Fair: 12°C (average), dry, 1 wind, cloud 6/8, good visibility.
3	13/07/2022	Fair: 12°C (average), light precipitation, 3 wind, cloud 4/8, good visibility

**Appendix 10: Bat transect route and static detector locations**

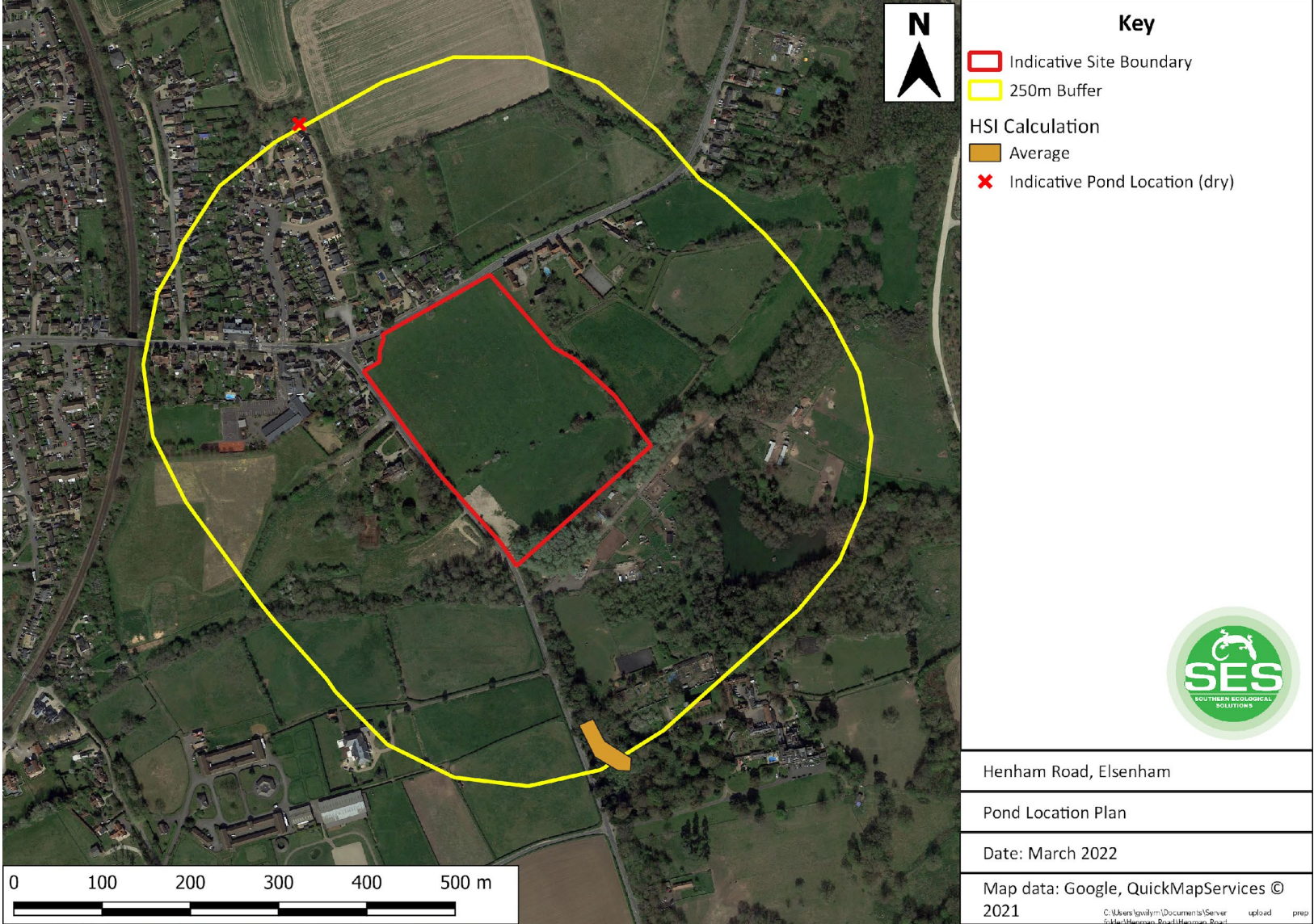




**Appendix 11: Bat activity heat map**



**Appendix 12: Pond Locations**



**Appendix 13: HSI Scores**

Ditch	Location		Pond Area		Pond Drying		Water Quality		Shade		Fowl		Fish		Ponds		Terrestrial Habitat		Macrophytes		HSI	Suitability
North	Zone A	1	350m <sup>2</sup>	0.7	Rarely Dries	1	Moderate	0.67	91-95%	0.3	Absent	1	Absent	3	3	0.6	Good	1	0%	0.9	0.6979	<b>Average</b>

## Appendix 14: Species of Benefit to Bats

The following table is reproduced from *Gunnell, K., Grant, G. and Williams, C. (2012). Landscape and Urban Design for Bats and Biodiversity, Bat Conservation Trust*. This suggests plant species that can provide benefit for bats by either providing a food source for insects and/or roost potential. The plants listed are predominately native to Britain. The small group of non-native plants included for their documented value for wildlife. This list has been checked against Natural England's list of invasive non-native plants.

Plant species	Common name	Native (N)	Type	Benefit	Soil	Light	Extensive green roofs	Living walls	Rain gardens	Hedge/ trees	Beds/ borders
<i>Acer campestre</i>	Field maple	N	T/S	C	Any	Sun/ shade				Y	
<i>Acer platanoides</i>	Norway maple		T	S	Well drained/ alkaline	Sun/ shade				Y	
<i>Acer saoocharum</i>	Sugar maple		T	S	Any	Sun/ shade				Y	
<i>Achillea millefolium</i>	Yarrow	N	HP	C,F	Well drained	Sun				Y	
<i>Ajuga reptans</i>	Bugle	N	HP	C,F	Any	Sun/ shade	Y		Y		
<i>Anthyllis vulneraria</i>	Kidney vetch	N	HP	F	Well drained	Sun	Y				
<i>Aubrieta deltoidea</i>	Aubrieta		H	F	Well drained	Sun/shade		Y			
<i>Betula pendula</i>	Sliver birch	N	T	C	Sandy/ acid	Sun				Y	
<i>Cardamine pratensis</i>	Cuckoo- flower	N	HP	F	Moist	Sun/ shade			Y		Y
<i>Carpinus betulus</i>	Hornbeam	N	T	C	Clay	Sun				Y	
<i>Centaurea nigra</i>	Common knapweed	N	HP	C,F	Dry, not acid	Sun	Y				Y
<i>Centranthus ruber</i>	Red valerian		HP	F	Well drained	Sun	Y				Y
<i>Clematis vitalba</i>	Old man's Beard	N	C	F	well drained/ alkaline	Sun				Y	
<i>Corylus avellana</i>	Hazel	N	S	C	Any dry	Sun/ shade		Y		Y	
<i>Crataegus monogyna</i>	Hawthorn	N	S	S,C	Any	Sun/shade				Y	
<i>Daucus carota</i>	Wild carrot	N	Bi	S,C,F	Any	Sun	Y				Y
<i>Dianthus spp.</i>	Pinks	N	A-Bi	F	Well drained	Sun	Y	Y			Y
<i>Digitalis purpurea</i>	Foxglove	N	Bi	C	Well drained	Shade/ partial shade				Y	Y
<i>Erica cinera</i>	Bell heather	N	S	F	Sandy	Full sun					Y
<i>Ersimum cherira</i>	Wallflower		Bi-P	F	Well drained	Sun		Y			Y
<i>Eupatorium</i>	Hemp agrimony	N	H	F	Moist	Sun/ shade			Y		Y
<i>Fagus sylvatica</i>	Beech	N	T	C, R	Well drained alkaline	Sun/shade				Y	
<i>Foeniculum vulgare</i>	Fennel		H	F	Well drained	Sun					Y

Plant species	Common name	Native (N)	Type	Benefit	Soil	Light	Extensive green roofs	Living walls	Rain gardens	Hedge/ trees	Beds/ borders
<i>Fraxinus excelsior</i>	Common Ash	N	T	C, R	Any	Sun/ shade				Y	
<i>Hebe spp.</i>	Hebe species		S	F	Well drained	Sun /shade				Y	Y
<i>Hedera Helix</i>	Ivy	N	C	F,C	Any	Sun/ shade		Y	Y	Y	Y
<i>Hesperis matronalis</i>	Sweet Rocket		H	F	Well drained/ dry	Sun/ shade					Y
<i>Hyacinthoides non-scripta</i>	Bluebell	N	B	F	Loam	Shade/ partial shade		Y		Y	Y
<i>Ilex aquifolium</i>	Holly	N	T	C	Any	Sun/ shade				Y	
<i>Jasmine officinale</i>	Common jasmine		C	F	Well drained	Sun		Y			Y
<i>Lavandula spp.</i>	Lavender species		S	F	Well drained / sandy	Sun		Y			Y
<i>Linaria vulgaris</i>	Toadflax	N	HP	C	Well drained/ alkaline	Sun	Y				Y
<i>Lonicera periclymenum</i>	Honeysuckle	N	C	F	Well drained	Sun		Y		Y	
<i>Lotus corniculatus</i>	Bird's foot trefoil	N	HP	F	Well drained/ dry	Sun	Y				Y
<i>Lunaria annua</i>	Honesty		Bi	F	Any	Sun/ partial shade	Y				Y
<i>Malus spp.</i>	Apple		T	C	Any	Sun				Y	Y
<i>Matthiola longipetala</i>	Night - scented stock		A	F	Well drained/ moist				Y		Y
<i>Myosotis spp.</i>	Forget me not species	N	A	F	Any	Sun	Y	Y			Y
<i>Nicotiana glauca</i>	Ornamental tobacco		A	F	Well drained moist	Sun /partial shade			Y		Y
<i>Oneothesa spp.</i>	Evening primrose		Bi	F	Well drained	Sun	Y				Y
<i>Origanum vulgare</i>	Marjoram	N	HP	F	Well drained / dry	Sun				Y	
<i>Populus alba</i>	White poplar	N	T	C	Clay loam	Sun				Y	
<i>Primula veris</i>	Cowslip	N	HP	F	Well drained/ moist	Sun/ partial shade	Y				Y
<i>Primula vulgaris</i>	Primrose	N	HP	F	Moist	Partial shade	Y	Y		Y	Y
<i>Prunus avium</i>	Wild cherry	N	T	C	Any	Sun				Y	Y
<i>Prunus domestica</i>	Plum		T	C	Well drained/ moist	Sun				Y	Y
<i>Prunus spinosa</i>	Blackthorn	N	S	C	Any	Sun/ partial shade				Y	
<i>Quercus petraea</i>	Sessile oak	N	T	C,R	Sandy loam	Sun/ shade				Y	
<i>Quercus robur</i>	Common oak	N	T	R	Clay Loam	Sun/ shade				Y	
<i>Rosa canina</i>	Dog rose	N	S	C	Any	Sun			Y	Y	Y

Plant species	Common name	Native (N)	Type	Benefit	Soil	Light	Extensive green roofs	Living walls	Rain gardens	Hedge/ trees	Beds/ borders
<i>Salix spp.</i>	Willow species	N	S	S,C	Moist	Sun/ shade			Y	Y	
<i>Sambucus nigra</i>	Elder	N	T	C	Clay loam	Sun				Y	
<i>Saponaria officinalis</i>	Soapwort	N	HP	F	Any	Sun					Y
<i>Saxifraga oppositifolia</i>	saxifage	N	HP	C	Well drained	Sun	Y	Y			Y
<i>Scabiosa columbaria</i>	small scabious	N	HP	F	Well drained/ alkaline	Sun	Y				Y
<i>Sedum spectabile</i>	Ice plant		HP	F	Well drained/ dry	Sun	Y				Y
<i>Silene dioecia</i>	Red campion	N	HP	F	Any	Shade/ partial shade		Y	Y	Y	Y
<i>Sorbus aucuparia</i>	Rowan	N	T	C	Well drained	Sun				Y	
<i>Stachys lanata</i>	Lamb's ear		HP	F	Well drained/ dry	Sun					Y
<i>Symphotrichum spp.</i>	Michalemas daisies		HP	F	Any	Sun					Y
<i>Tages patula</i>	French marigold		A	F	Well drained	Sun					Y
<i>Thymus serpyllum</i>	Creeping thyme	N	HP/S	F	Well drained/ dry	Sun	Y	Y			Y
<i>Tilia x europaea</i>	Common lime		T	C	Any	Sun/ shade				Y	
<i>Trifolium spp.</i>	Clover species	N	H	F	Any	Sun	Y				Y
<i>Valerina spp.</i>	Valerian species	N	HP	F	Moist	Sun/ partial shade			Y		Y
<i>Verbascum spp.</i>	Mulliens	N	Bi, HP	C	Well drained	Sun					Y
<i>Verbena bonariensis</i>	Verbena		HP	F	Well drained/moist	Sun					Y
<i>Viburnum lantana</i>	Wayfaring tree	N	S	C	Any	Sun/ shade				Y	Y
<i>Viburnum opulus</i>	Guelder rose	N	S	C	Moist	Sun/ shade			Y	Y	
<i>Viola tricolor</i>	Pansy	N	A	F	Well drained/ moist		Y	Y			Y

### Legend

Type		Benefit	
HP	Herbaceous perennial	C	Moth caterpillar food plant
Bi	Biennial	S	Sap sucking insects (e.g. whiteflies)
BiP	Biennial perennial	F	Flowers attract adult moths
T	Tree	E	Good roost potential
S	Shrub		
H	Herb		

A	Annual	
B	Bulb	
C	Creeper/ climber	