



Ecological Assessment

Land East of Station Road, Elsenham

On Behalf of:

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Sensitive information regarding badgers has been redacted from this report

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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 the ecological assessment undertaken at Land East of Station Road, Elsenham, Essex.
2. The Site consists arable land, and improved grassland. The majority of the site is considered to be of inherently low ecological value.
3. The proposed development comprises up to 200 residential dwellings, involving the clearance of the arable land and improved grassland.
4. The site has the potential to support a range of protected and notable species including foraging/commuting bats, nesting birds, foraging/commuting badgers, common reptiles and European hedgehog. Recommended mitigation measures to protect these species include wildlife sensitive lighting, sensitive clearance of vegetation for nesting birds (outside of the bird breeding season where possible, March to August inclusive), hedgehogs (outside hibernation season, following a nest search) and reptiles (during the active season, with long grasses/ruderals to be subject to a two-stage cut under a method statement); and precautionary measures during construction for hedgehog, brown hare and badgers. Furthermore, it is recommended that a reptile exclusion fence is installed to prevent nearby populations of reptiles entering the site during the construction phase.
5. The site falls within the Impact Risk Zone for Elsenham Woods SSSI and Hatfield Forest that relates to residential planning applications of 50 and 100 or more units respectively. No direct or indirect impacts are considered likely in isolation as a result of this development but a contribution to the Strategic Access Management Measures (SAMMs) will be required to appropriately mitigate in combination impacts of the proposed development. This should be agreed with Natural England and/ or the National Trust (who own and manage the site).
6. A Biodiversity Net Gain (BNG) assessment has been included within this report to satisfy national planning policy framework (NPPF) (MHCLG, 2021). It has been demonstrated that a measurable net gain can be delivered for this development of above 10% and it is recommended that a Biodiversity Net Gain Design Stage Report is produced to support a detailed planning application. A landscape ecology management plan (LEMP) should also be secured by an appropriately worded planning condition to ensure the created habitats are implemented and managed appropriately to achieve their target conditions.
7. Overall, the site was considered to be of low ecological value. Through implementing the recommended measures detailed in this report, it is considered that a BNG of 12.67% can be achieved and all adverse effects from the proposed development on the habitats and species on site fully mitigated in accordance with relevant wildlife legislation, the NPPF (MHCLG, 2021) and Uttlesford District Councils Local Plan and planning policies related to biodiversity (Uttlesford District Council, 2005) (now withdrawn).

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1.0 Introduction

1.1 Southern Ecological Solutions Ltd. (SES) was commissioned by Bloor Homes Ltd to undertake an Ecological Assessment of the Land East of Station Road, Elsenham ('the Site'). This report has been produced to support an Outline Planning application with all matters reserved except for the primary means of access for the development of up to 200 residential dwellings along with landscaping, public open space and associated infrastructure works. The Site is located at Ordnance Survey Grid Reference TL 5352 2713 and is approximately 11.12 ha in extent.

1.2 The Site was comprised of arable land with improved grassland to the northwest. To the east and south of the Site was arable farmland. Beyond the west boundary lies Elsenham station and residential development. The Site location and proposed scheme are found in Appendix 1. The proposed scheme forms Phase 2 of a development project for which Phase 1 has already received full planning permission UTT/21/3269/DFO.

1.3 The objectives of this Ecological Appraisal were 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;
- 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 local nature conservation policies, and Uttlesford District Councils Local Plan (UDC, 2005) (now withdrawn).

1.4 Reptile surveys were conducted as a result of the initial Phase 1 assessment, the results of which have been included within this report.

1.5 Details of relevant wildlife legislation and planning policies are provided in Appendix 2.

2.0 **Methods**

2.1 The approach taken follows guidance and methods as prescribed by the Chartered Institute for Ecology and Environmental Management (CIEEM), specifically the Guidelines for Ecological Appraisal 2nd edition (2017) and the Guidelines for Ecological Impact Assessment (2022). 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 recommended mitigation and enhancement measures.

Desk Study

2.2 SES commissioned a data search for records of protected and notable species from Essex Field Club in September 2021. The data search encompassed the study area, and up to 2km from the Site boundary.

2.3 Hazel dormouse *Muscardinus avellanarius* records were also sought from the National Biodiversity Network (NBN) Atlas 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.

2.4 Previous ecological surveys undertaken on the wider site and the site by Fairfield Partnership in 2014 and on the land to the south of the Site that form Phase 1 of the development project by SES (2021) were reviewed which support the outline and reserved matters application consent for Phase 1 which have been approved. A web-based search for statutory designated sites via the Multi Agency Geographic Information for the Countryside (MAGIC) spatial data resource magic.defra.gov.uk was undertaken on 7th October 2021 for the following statutory designated sites: Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar sites (up to 22km from the Site boundary, as per the maximal Zone of Influence (Zoi) for Essex coastal internationally designated sites, see Table 1) and Sites of Special Scientific Interest (SSSI) and Local Nature Reserve (LNR) (5km from the Site boundary). Locally important sites were searched within a 2km zone from the application Site.

2.5 The Proposed Strategic Solution for Hatfield Forest SSSI (Natural England, 2019) was referred to in order to determine the Zone of Influence (Zoi) for Hatfield Forest SSSI and hence the requirement for mitigation.

2.6 The Essex Coast Recreational Disturbance Avoidance and Mitigation Strategy (RAMS) Habitats Regulations Assessment Strategy document for 2018-2038 (Place Services, 2019) was referred to in order to determine the Zone of Influence (Zoi) for coastal European Designated sites and hence the requirement for off-site mitigation (Table 1).

Table 1: Zones of Influence of Essex Coast European Designated Sites (Place Services, 2019)

European designated site	Underpinning SSSIs*	Zois (km)
Stour and Orwell Estuaries SPA and Ramsar	Orwell Estuary SSSI Stour Estuary SSSI Cattawade Marshes SSSI	13
Hamford Water SPA and Ramsar	Hamford Water SSSI	8
Colne Estuary SPA and Ramsar	Colne Estuary SSSI	9.7
Blackwater Estuary SPA and Ramsar	Blackwater Estuary SSSI	22
Dengie SPA and Ramsar	Dengie SSSI	20.8

European designated site	Underpinning SSSIs*	ZoIs (km)
Crouch and Roach Estuaries Ramsar and SPA	Crouch and Roach Estuaries SSSI	4.5
Foulness Estuary SPA and Ramsar	Foulness SSSI	13
Essex Estuaries SAC	Blackwater Estuary SSSI Colne Estuary SSSI Crouch and Roach Estuaries SSSI Dengie SSSI Foulness SSSI	**
Benfleet and Southend Marshes SPA and Ramsar	Benfleet and Southend Marshes SSSI	4.3
Thames Estuary and Marshes SPA and Ramsar	Mucking Flats and Marshes SSSI	8.1
*Underpinning SSSIs are listed for Essex sites as these are what the Impact Risk Zones (IRZs) are aligned to.		
**The Essex Estuaries SAC comprises the Colne Estuary, Blackwater Estuary, Dengie, Crouch and Roach Estuaries and Foulness Estuary and so follow the respective ZoIs throughout.		

SPA = Special Protection Area; SSSI = Site of Special Scientific Interest; SAC = Special Conservation Area

2.7 Maps of the area of assessment and wider area, using the MAGIC online spatial data resource and aerial photographs on Google Earth (Google Inc., 2011), were examined to determine the possible habitats present on, and adjacent to the area of assessment, and their context in the surrounding landscape, searching in particular for waterbodies, 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 17th August 2021 by suitably qualified ecologist Pete Scott-Norris BSc (Hons) during appropriate weather conditions. 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 (JNCC, 2010). Habitat mapping was undertaken using the standard classification to indicate habitat types. Features of ecological interest and value were highlighted using target notes.

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 (2019).

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.

Biodiversity Net Gain (BNG)

BNG Assessment

2.12 A biodiversity net gain calculation was undertaken using the DEFRA metric 3.1 (Excel spreadsheet). This uses data on existing and proposed habitat areas. The calculator uses habitats based on the UK Habitat classification system (Butcher *et al*, 2020), therefore, the habitats as recorded onsite using the JNCC Phase 1 methodology are translated into the relevant habitat type under the UK Habitat Classification system. Once the habitats have been assigned a classification the habitat areas are split between linear features, such as hedgerows, which are measured in kilometres (km) and non-linear habitat, which are measured in hectares (Ha). The measurements for these features are entered into the calculator along with other factors to calculate losses and gains within the DEFRA metric. These other key factors include:

- **Distinctiveness** - Each habitat in the UK Habitat Classification is automatically assigned a score for distinctiveness within the metric. Distinctiveness recognises the different characteristics of habitats in relation to their capacity for supporting species richness, their tendency to support species found rarely in other habitats, and the rarity of the habitat itself.
- **Condition** - The condition of each habitat is assessed separately using the methods set out in the Biodiversity Metric 3.1: User Guide (Natural England, 2022). This approach details condition criteria for each habitat type, and then applies thresholds for how many of these criteria are met to establish the condition score. The condition score ranges between good, moderate, poor, or not applicable. This latter category is given to habitats with a very low distinctiveness and/or features associated with agriculture.
- **Strategic significance** - This element is to assess the habitats on Site in relation to the geographical location in which they are found. Information to determine the significance of a habitat within a specific landscape can be found in a variety of sources that include: local plans, local biodiversity records and National Character Areas. The strategic significance is based on three categories which equates to a different score, which are as follows: High – 1.15; Medium – 1.1 and Low - 1.

2.13 Calculations were undertaken by Pete Scott-Norris. The Phase 1 habitat map was used to calculate existing linear and non-linear habitat areas and mapped using QGIS. Proposed habitat areas were calculated from The Parameter Plan: Land Use, Open Space & Access (Carter Jonas, 2022) (Appendix 1) and mapped using QGIS.

Protected and Notable Species

2.14 For detailed methods for protected and notable species, see Appendix 3.

Badger

2.15 An initial assessment was made to identify areas that might be used by badgers *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 mammal paths, hairs, latrines and setts.

Bats

- 2.16** The Site was initially assessed for its suitability to support roosting, foraging and commuting bats. All existing habitats were assessed for suitability for bats using guidelines issued by the Bat Conservation Trust (Collins, 2016). Detailed methods are provided in Appendix 3. Trees were inspected from ground level only.

Birds

- 2.17** The Site was assessed for its potential to support breeding birds and significant wintering and/or migratory bird populations. Suitable habitat generally includes scrub, hedgerows and trees and can also include buildings, open grassland, open water and piles of debris.

Great Crested Newt

- 2.18** Aquatic habitats in the vicinity were assessed for their suitability to support breeding great crested newts using the Habitat Suitability Index (HSI) (Oldham *et al.*, 2000). Further detail on the HSI method is provided in Appendix 3.
- 2.19** Terrestrial habitats were also assessed for their suitability for great crested newts. Suitable terrestrial habitat generally comprises rough grassland and woodland where they can forage and hibernate, with good links to the ponds where they breed.

Hazel Dormice

- 2.20** Habitats were assessed for their general suitability for hazel dormice during the Extended Phase 1 Habitat Survey. 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 variety of food sources, plants suitable for nest-building materials and habitat connectivity.

Invertebrates

- 2.21** The Site was assessed for its potential to support rare or notable invertebrate species. 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

Preliminary Assessment

- 2.22** The Site was assessed for its suitability for the four widespread reptile species; common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix helvetica* 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 snakes 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.

Presence/likely absence survey

- 2.23** This survey methods followed best practice guidance (Froglife, 1999; Gent & Gibson, 2003; and Natural England, 2011). Further detail on the methodology is provided in Appendix 3.
- 2.24** Artificial reptile refugia, made of roofing felt tiles, were laid within the area of semi-improved grassland within the Site and adjacent to the Site during 2021. A total of 30 roofing felt tiles were installed at a high density within and adjacent to the development footprint and were searched for on seven visits from 21st September to the 4th October 2021. The tiles were left for 1 week to “bed in” before the survey visits commenced.
- 2.25** Visits were undertaken on non-consecutive days in suitable weather conditions on mornings or afternoons with suitable temperatures (between 11 °C and 17°C), no heavy rain or strong winds.
- 2.26** Any reptiles found were identified with life stage and location recorded and mapped. The starting daytime temperature, general weather conditions and the maximum windspeed were also recorded for each survey visit.

Other Notable Species

- 2.27** The Site was assessed for its potential to support Natural Environment and Rural Communities (NERC) Act (2006) species of principal importance which are likely to occur in the local area.

Assessment of Nature Conservation Value

- 2.28** CIEEM guidelines for Ecological Assessment in the United Kingdom (2022) 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 and extended Phase 1 habitat survey have 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. Further targeted survey will refine the evaluation and associated recommendations.
- 2.29** The following geographical scale categories are considered appropriate:
- International.
 - National (*i.e.*, England);
 - Regional (Southeast);
 - County (Essex).
 - District (Uttlesford).
 - Local or Parish (Elsenham); and
 - Within ‘Site’ or zone of influence only

Constraints

2.30 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. Reptile surveys were conducted at the end of September and the first week of October. October is not considered optimal however given the temperatures and weather conditions were optimal at the time of the surveys this is not considered a constraint.

2.31 Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by SES for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

3.0 Baseline Ecological Conditions

Statutory Designated Sites

3.1 There were no sites of **international** importance designated under the Conservation of Habitats and Species Regulations (CHSR, 2019, as amended) within 10km of the Site. The Site does not fall within the Zone of Influence (Zoi) of any of these sites or sites designated under the Essex Coast RAMS (Place Services, 2018).

3.2 There were three sites of **national** importance within the search area (5km), all were Sites of Special Scientific Interest (SSSI). The closest of these was Elsenham Wood SSSI c. 1.9km south-west, notified for its ancient woodland habitats which supports a number of national uncommon plant species including Oxlip *Primula elatior*.

3.3 The Site falls within the Natural England Impact Risk Zone (IRZ) for Elsenham Woods SSSI. New residential development of ≥50 units within the IRZ is identified as having potential to impact this SSSI.

3.4 The Site is located c.5.5km north of Hatfield Forest SSSI, as such, the Site falls within this SSSIs Zoi (Natural England, 2019). Hatfield forest is designated for its ancient forest mosaic.

Table 2. European Designated Sites within up to 10km, Nationally Designated Sites within 5km and Statutory and Non-Statutory Locally Designated sites within 2km of the Site

Site Name	Distance and Direction	Size (ha.)	Description & Reason for Designation
European Statutory Designated Sites			
None			
UK Statutory Designated Sites			
Hall Quarry SSSI	1.6km north-west	0.7	Geological designation (only).
Elsenham Wood SSSI	2.1km south-east	44.4	Designated for its ancient woodland habitats supporting nationally uncommon Oxlip <i>Primula elatior</i> .
Quendon Wood SSSI	2.8km north-west	33.5	Designated for its ancient woodland habitats supporting nationally uncommon Oxlip <i>Primula elatior</i> .

Non-statutory Designated Sites

3.5 There are four Local Wildlife Sites (LWS) within the search radius of the site (Table 3). These sites are considered to be of **county** value.

Table 3: Non-statutory Designated Sites within 2km of the Site

Site name	Distance & Direction	Size (ha)	Description & Reason for Designation
Alsa Woods LWS	0.4km west	26.4	Ancient woodland habitat and diverse ground flora. The eastern boundary comprises more recent woodland habitat.
Aubrey Buxton Reserve LWS	1.2km west	9.1	Complex of woodland coppice, grassland and pond habitats that supports a diverse range of flora and invertebrate species.
Lady Wood/Regent's Spring LWS	1.4km east	11.9	Good examples of old if not ancient woodland coppice with a reasonably diverse ground flora which includes early purple orchid <i>Orchis mascula</i> , common spotted orchid <i>Dactylorhiza fuchsii</i> , herb paris <i>Paris quadrifolia</i> and oxlip <i>Primula elatior</i> .
Wilkin's Plantation LWS	1.7km south	1.7	Streamside woodland with a rich flora that is considered to be ancient.

Habitats

3.6 A Phase 1 Habitat map of the site is provided within Appendix 4. Plant species recorded per habitat type are tabled in Appendix 5 and Site photographs can be found in Appendix 6.

3.7 The Phase 1 Habitat types (JNCC, 2010) within the Site were:

- Cultivated arable Land
- Improved grassland

J1.1 - Cultivated Arable Land

3.8 The Site was predominantly cultivated arable land which had recently been harvested at the time of survey.

B4 - Improved grassland

3.9 A strip of improved grassland bordered the north western edge of the Site adjacent to the station car park. This area was dominated by cocks foot *Dactylis glomerata* with an abundance of great horsetail *Equisetum telmateia* to the western edge. Other species included common bent *Agrostis capillaris*, Yorkshire fog *Holcus lanatus* bramble *Rubus fruticosus* and bristly oxtongue *Helminthotheca echioides*. Occasionally present were common nettle *Urtica dioica*, perennial rye-grass *Lolium perenne*, ribwort plantain *Plantago lanceolata*, dog rose *Rosa canina* agg. Also present were saplings which included the species Ash *Fraxinus excelsior*, hawthorn *Crataegus monogyna* and sycamore *Acer pseudoplatanus*.

Summary

3.10 All habitats are considered to be of low ecological value and of importance at the **Site** level only. Confidence in this assessment is **high**.

Protected and Notable Species

3.11 These are species protected under the Conservation of Species and Habitat Regulations (CHSR, 2019 as amended) and The Wildlife and Countryside Act (WCA) (1981), The Protection of Badgers Act (1992), or listed in Section 40 or 41 of the NERC Act (2006). Protected and notable species with existing records within 2km of the Site are detailed in Table 4 below. This included 13 species and 38 records.

Table 4: Summary of Protected and Notable Species Identified in the Data Search

Species	Total Records	Most Recent Record	Distance to Nearest Record
UK Protected Species			
Birds			
Red Kite (<i>Milvus milvus</i>) s.1	8	2020	0 km
Redwing (<i>Turdus iliacus</i>) s.1	2	2019	0 km
Fieldfare (<i>Turdus pilaris</i>) s.1	3	2019	0 km
Hobby (<i>Hypotriorchis</i>) s.1	1	2020	0 km
White-tailed Eagle (<i>Haliaeetus albicilla</i>) s.1	1	2020	0 km
Greylag (<i>Anser anser</i>) s.1	1	2015	1 km
Bats			
Noctule (<i>Nyctalus noctule</i>) s.5	1	2014	1 km
Common Pipistrelle (<i>Pipistrellus pipistrellus</i>) s.5	5	2017	1 km
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>) s.5	3	2014	1 km
Mammals			
Badger (<i>Meles meles</i>)	(redacted)	(redacted)	(redacted)
Reptiles & Reptiles			
Common Toad (<i>Bufo bufo</i>) s.5 s.42	1	2019	1.5 km
Great Crested Newt (<i>Triturus cristatus</i>) s.5, s.42	6	2019	1.5 km
Common Frog (<i>Rana temporaria</i>) s.5	1	2018	2 km

s.1 Schedule 1, and s.5 Schedule 5 listed species (W&C Act 1981); s.41 section 42 listed species (NERC Act 2006); b.act. Protection of Badger Act 1992.

Rare and Notable Flora

3.12 No records of protected plant species listed in Schedule 8 of the WCA (1981) were recorded within 2km of Site within the last 10 years, nor any other Schedule 8 plants and none were observed during the Site visit. Flora comprised of common species that are frequently associated with the habitats present on Site. The Site is considered to be of **negligible** value for rare and notable plants and as such are not considered further in this assessment.

3.13 There were no records of invasive plant species listed in Schedule 9 of the WCA (1981) within 2km of Site. No Schedule 9 species of plants were identified at the time of survey.

3.14 Field horsetail *Equisetum arvense* was observed on Site and although it is native and not included in Schedule 9 it is still considered invasive.

Badgers

- 3.15** Sensitive information regarding the specific location of badger setts has been redacted from this report due to confidentiality issues regarding the protection of badgers. No signs of a main sett were noted on site such as well-worn tracks or obvious spoil heaps.
- 3.16** The Site was considered to have suboptimal habitat suitable foraging/commuting and for future sett building as preferred habitats (earth banks, hedgerows and woodland) were not present.
- 3.17** The Site is assessed as being of **local** importance for badgers, confidence in this assessment is **high**.

Bats

- 3.18** In 2017, the wider site was surveyed for bat activity, which recorded the presence of common pipistrelle *Pipistrellus pipistrellus* and a *Nyctalus* species *Nyctalus sp.* on site (Fairfield Partnership, 2017). The data search returned five common pipistrelle, three soprano pipistrelle *Pipistrellus pygmaeus* and one Noctule *Nyctalus noctule*; all records were associated with an area 0.5km to the south of the Site.

Roosting Bats

- 3.19** There were no buildings or trees on Site at the time of the assessment.
- 3.20** The Site is considered to be of **negligible** importance for roosting bats. Confidence in this assessment is **high**.

Foraging/Commuting Bats

- 3.21** A hedgerow with trees existed approximately 15m beyond the western boundary which was considered to offer opportunities for foraging and commuting bats and also offered connectivity to surrounding habitats to the north and south.
- 3.22** The majority of the Site is open arable land that was well managed at the time and considered to be of negligible suitability for foraging and commuting.
- 3.23** The habitat adjacent to the western boundary was valued as being of low suitability for foraging and commuting bats (Collins, 2016; see Appendix 3). As such, foraging/commuting bats are considered to be of **Site** value. Confidence in this assessment is **high**.

Birds

- 3.24** Between 2011 & 2013, the wider site was surveyed for breeding birds which recorded the presence of six red-listed Birds of Conservation Concern (BoCC) and five amber-listed BoCC (Fairfield Partnership, 2017) in accordance with the most recent conservation assessment (Eaton et al., 2015). The data search returned 16 Schedule 1 protected bird species. The majority of these were common in rural areas including redwing and fieldfare which are wintering migratory species. Greylag goose and white-tailed eagle were also recorded which are associated with wetland and coastal areas of Britain and as such, unlikely to be breeding on the Site.
- 3.25** Breeding bird surveys were undertaken in 2021 for the Phase 1 stage of the development to the south of the Site (SES, 2021). These surveys recorded a total of 27 species of which 16 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 Phase 1 site and were either recorded foraging on the site or flying over. The Phase 1 site supported three breeding territories for skylark *Alauda arvensis*, with individual birds identified during all three visits. No other ground nesting birds were recorded on site during any of the surveys.
- 3.26** It was considered likely that skylarks would utilise the Site for nesting due to their confirmed presence in the site to the south and the availability of suitable arable land for nesting. However, none were observed during the extended phase 1 survey.
- 3.27** Habitats on Site are not considered suitable to support notable wintering bird assemblages. The Site was considered likely to support a limited assemblage of breeding skylarks. As such, breeding birds were assessed as being of **Site** value. Confidence in this assessment is **high**.

Great Crested Newt

- 3.28** In 2011, the wider site was surveyed for GCN which recorded the absence of this species on the site (Fairfield Partnership, 2017). The data search returned six records of GCN within 2km of the Site in the last 10 years, the most recent was from 2019 and was 1.5km away. A further desktop data search using NBN gateway was undertaken in 2021. 18 records of GCN were returned, all were associated with Golf World Stansted 1.6km south-east of the Site.
- 3.29** The Site offered limited suitable terrestrial habitat in the form of semi-improved grassland that bounded the station carpark, and a length of hedgerow on the northern boundary.
- 3.30** Aquatic habitat within the wider landscape includes five waterbodies within 250m of the Site, although only three were considered to be ecologically connected to the Site (waterbodies 1, 2, 3). The closest waterbody was Pond 3 which is approximately 45m to the northeast of the Site.
- 3.31** A Habitat Suitability Index (HSI) was calculated for all ecologically connected waterbodies within 250m of the Site to assess their suitability for great crested newts (Oldham *et al.*, 2010). Waterbodies 1, 2, 3 were dry at the time of survey and waterbody 14 was a lined garden pond making them unsuitable for GCN. Pond 4 was considered to be of 'average' suitability (full results are shown within Appendix 9).

eDNA Survey

- 3.32** An eDNA survey was undertaken on Pond 4 in April 2021 by SES as part of an ecological assessment for phase 1 of the development (SES, 2021). Pond 4 returned a negative result for GCN. Details of the eDNA analysis are presented in Appendix 9. The results provided by the eDNA analysis indicate the likely absence of GCN within the waterbody.
- 3.33** Given the negative eDNA result for Pond 4, the unsuitability of waterbodies 1, 2, 3 and 14 and limited terrestrial habitat, this species is considered to be absent from the Site.
- 3.34** As such, the Site is considered to be of **negligible** importance for GCN which are not considered further in this report.

Hazel Dormice

- 3.35** In 2011, the wider site was surveyed for dormouse which recorded the absence of this species (Fairfield Partnership, 2017). The data search returned no results for hazel dormice within 2km of the Site in the last 10 years. A data search was undertaken in 2017 by FPCR (Fairfield Partnership, 2017) who received data from ECCOS with no further records identified. In 2019, SES (SES, 2020) undertook dormouse surveys to inform a planning application (UTT/19/2470/OP) for a residential development adjacent to Alsa Wood (0.5km west) which recorded an absence of this species.
- 3.36** A desktop data search using NBN gateway (to which the People's Trust for Engaged Species (PTES) provides dormouse records) was undertaken in 2021. No records were returned within 4km of the Site. To the west there is a record 4.7km away at Birchhanger but this record is separated from the Site by the M11. To the south 5.5km away, records of dormouse at Hatfield Forest were identified. To the north, the closest record was just north of Thaxted at 9.5km.
- 3.37** Further surveys were undertaken for hazel dormice by SES in 2021 (SES, 2021) as part of Phase 1 of the development to the south of the Site to support the reserved matters application. 100 nest tubes were strategically positioned in suitable linear habitat on site. No evidence of dormouse was identified during these surveys therefore this species was considered to be absent from the phase 1 site.
- 3.38** Habitats on Site are considered suboptimal for hazel dormice (arable and improved grassland). Habitats beyond the north, south and east of the Site are considered suboptimal with expansive open arable farmland, and to the west is residential development associated with the village of Elsenham.
- 3.39** Given the limited suitable habitat on Site and that the Site is surrounded by arable land and residential development to the west, resulting in a lack of connectivity to known populations, no further consideration to hazel dormouse is deemed necessary in this report and this species is not discussed further.

Invertebrates

- 3.40** In 2011, the wider site was surveyed for invertebrates which recorded 21 species of conservation concern in the former sandpit area to the east of the site (Fairfield Partnership, 2017). No protected invertebrate species were returned in the data search within 2km of the Site and in the last 10 years. The Site partially lies within an area identified as particularly relevant for creating habitat for pollinating insects, termed a B-Line (Buglife,

2021), which is part of the National Pollinator Strategy (DEFRA, 2018). A plan showing where the B-line intersects the Site is shown in Appendix 10.

3.41 Given the very limited extent and structural diversity of habitats on Site, it is unlikely that the Site would support a notable invertebrate assemblage. However, native species hedgerows with trees such as those present on the northern boundary, and in particular fruiting trees such as the elder that is present are known to be associated with a variety of invertebrates. Therefore, invertebrates are considered to be of **Site** value. Confidence in this assessment is **high**.

Reptiles

Desk Study

3.42 In 2011, the wider site was surveyed for reptiles which recorded a 'good' population (Maximum count of 11) of slow worm on the wider site (Fairfield Partnership, 2017). The data search returned no reptiles within 2km of the Site in the last 10 years. In 2021 SES conducted reptile presence/likely absence surveys on phase 1 of the development to the south of the Site which recorded four common lizard (low population), 14 slow worm (good population) and one grass snake (low population).

Preliminary Assessment

3.43 The existing habitat suitable for reptiles is limited to the semi-improved grassland. An area adjacent to the northeast corner of the Site, provided further suitable habitat of semi-improved grassland and scrub which was directly connected to the Site.

Reptile Surveys

3.44 Given the suitability of habitat on and adjacent to Site along with the evidence of reptiles present on the neighbouring phase 1 of the development, presence/likely absence surveys were conducted. 30 mats were positioned along the length of semi-improved grassland that bordered the station carpark and within the area of semi-improved grassland adjacent to Site. The mats were positioned as per recommended guidance (Froglife, 1999). A summary of the results, including weather conditions at the time of survey, are included in Table 5. The detailed results can be found in Appendix 11.

Table 5: Summary of Reptile Survey Results

Visit No.	Date	Time of day	Weather	Temp °C	Reptiles Species Recorded
1	21/09/2021	Afternoon	Part cloudy, mild, calm wind, dry.	17	2 juvenile common lizards
2	23/09/2021	Afternoon	Mainly clear, mild, calm wind, dry.	17	1 male common lizard 3 female common lizards 2 juvenile slow worms
3	25/09/2021	Afternoon	Cloudy, mild, dry, light breeze.	17	9 juvenile common lizards 3 female common lizards 3 male common lizards 1 juvenile slow worm
4	27/09/2021	Afternoon	Cloudy, mild, light breeze, dry.	17	1 male common lizard 3 juvenile common lizards 2 juvenile slow worms

Visit No.	Date	Time of day	Weather	Temp °C	Reptiles Species Recorded
5	29/09/2021	Afternoon	Cloudy, mild, calm wind, dry.	15	11 adult common lizards 2 juvenile common lizards
6	01/10/2021	Afternoon	Cloudy, mild, calm wind, dry.	16	2 male common lizards 5 female common lizards
7	04/10/2021	Afternoon	Mostly cloudy, mild, calm wind, dry.	14	4 female common lizards 2 juvenile common lizards 1 juvenile slow worm

3.45 The survey recorded 51 observations of common lizard which included 33 adults, this is considered an 'exceptional' population (Froglife, 1999). There was a total of 6 observations of slow worms, all of which were juveniles and therefore only represents a 'low' population. However, all of the observations were located in the area of semi-improved grassland adjacent to the Site (Appendix 11).

3.46 Whilst there were no observations of reptiles onsite utilising the strip of improved grassland during the survey, it is considered that there is potential that reptiles could utilise this area for foraging as it is directly connected to the area where the observations were recorded by a continuous strip of grassland. As such, reptiles were considered to be potentially present on Site and to be of **Site** value. Confidence in this assessment is **high**.

Other Notable Species

3.47 In 2011, the wider site was subject to further ecological surveys which recorded no incidental records of other notable species (Fairfield Partnership, 2017). The data search returned one record in the last 10 years within 2km for common toad *Bufo bufo* in 2019 which was 1.5km.

3.48 No priority species were observed on Site during the Phase 1 survey and reptile survey although it is possible that small numbers of hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, harvest mouse *Micromys minutus* and common toad are utilising the semi-improved grassland on Site.

3.49 Polecat *Mustela putorius* are considered absent from Site given that no suitable habitat for them (lowland wooded habitats, marshes or along riverbanks) is present on Site.

3.50 Hedgehogs, brown hare, harvest mouse and common toad are considered to be of **Site** value. Confidence in this assessment is **high**.

Summary

Table 6. Summary evaluation of features.

Feature	Summary Description	Importance	Confidence
SSSI	Three SSSIs lie within 5km of the Site. The Site lies within the IRZ of Elsenham Wood SSSI and the ZoI for Hatfield Forest SSSI	National	High
LWS	Four LWS lie within 2km of the Site.	County	High
Habitats	Predominantly negligible and low value habitat (arable land) with an improved grassland strip	Site	High
Badger	Information redacted.	Local	High
Bats – roosting	Likely absent.	Absent	High
Bats – commuting/foraging	Low suitability commuting habitat adjacent to Site.	Site	High
Breeding Birds	Likely to support a small breeding assemblage of skylark	Site	High
Great Crested Newt	Likely absent	Absent	High
Hazel Dormouse	Likely absent	Absent	High
Invertebrates	Unlikely to support a notable assemblage.	Site	High
Reptiles	Habitats (improved grassland) on Site directly connected to areas of known populations of common lizards and slow worm .	Site	High
Other Notable Species	Habitat suitable for hedgehog, brown hare, harvest mouse and common toad.	Site	High

4.0 Prediction of Impacts, Mitigation & Enhancement Measures

Description of Proposals

- 4.1 The development proposals comprise the erection of up to 200 residential units including access. The proposed scheme forms Phase 2 of a development project for which Phase 1 has already received outline and subsequent reserved matters planning permission (UTT/21/3269/DFO). The Illustrative Layout can be found in Appendix 1.

Statutory Designated Sites

Hatfield Forest SSSI

- 4.2 The Site falls within the SSSI Risk Zone for Hatfield Forest SSSI under the condition of any residential development of 50 or more units. This condition relates to the potential increase in recreational pressures associated with new residential developments within the Risk Zone of Hatfield Forest.
- 4.3 Natural England's revised interim advice for Hatfield Forest SSSI Risk Zone (Natural England, ref: HatFor Strategic Interim LPA, 5 April 2019) should be followed to ensure that impacts are minimised to this site from new residential development. As this application is more than 100 units, a developer contribution towards a package of funded Strategic Access Management Measures (SAMMs) at Hatfield Forest will be required to mitigate in combination effects (cumulative) of the proposed development. This should be agreed in consultation with Natural England and/ or the National Trust (who own and manage the site).
- 4.4 Mitigation for insolation potential recreational impacts as a result of Site will be dealt with through the provision of suitable alternative openspace onsite and/or with connectivity to offsite resources. There will be an onsite provision of 2.7ha of open space a proportion of which will be accessible natural green space which will include an onsite circular walk (c. 1.1km) with links to offsite public rights of way which will provide circular walks of 2.7km which will be advertised through information boards strategically located within the Site. In addition, dog bins will be provided with information on walking routes also given to new residents via welcome pack.
- 4.5 Due to the distance from the proposed development, other direct and indirect impacts on this site (such as pollution or noise disturbance during construction) are not predicted. Overall, a **neutral** residual effect of statutory sites is predicted.

Elsenham Wood SSSI

- 4.6 The Site falls within the IRZ for Elsenham Woods SSSI. The criteria advises likely impacts as a result of residential developments >50 units. Given the distances of approximately 2.1km 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 and pollution from increased traffic during the operational phase of development.
- 4.7 The air quality assessment report produced by WSP (WSP, 2022), screened out impacts in relation to air quality on all ecology designations with the exception of the Elsenham Woods SSSI. The assessment found ammonia (NH3) and nitrogen deposition exceeded the screening thresholds.

- 4.8** The effects of the increases in nitrogen oxide (NO_x) 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/m³. However, both ammonia (NH₃) and nitrogen (N) deposition levels modelled exceed critical levels/loads (1 µg/m³ and 15 kgN/ha/yr respectively). The effects of this exceedance is localised close to the road (within 20m and 10m of Hall Road for NH₃ 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.
- 4.9** Finally, in order to provide a suitably robust assessment, some appropriately worst-case assumptions have been made by the modelling undertaken (WSP, 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.
- 4.10** It should also be noted that when assessing the In-combination effects for NH₃ and N deposition it is clear that the proposals are a very small proportion of the predicted increase in traffic flows and the vast majority of the predicted adverse effects are associated with other committed development traffic emissions and Stanstead Airport.
- 4.11** 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 Statutory Designated Sites

- 4.12** Due to the distance from site (>1.6km) and lack of connected habitats direct and indirect impacts are not considered likely upon other nearby SSSIs (Hall Quarry and Quendon Wood), 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. Furthermore the mitigation proposals for Hatfield Forest SSSI will mitigate for any recreation effects on these sites as well.

Non-statutory Designated Sites

- 4.13** Four LWS are located within 2km of the Site; the closest of these is Alsa Woods LWS, which is located approximately 0.4km from the Site. It is considered that the development proposals are unlikely to have direct effects (such as pollution or noise disturbance during construction) on these sites. Indirect effects such as increased recreational disturbance is considered likely for the LWS's within 2km. Recreational impacts may include increased wear and tear on footpaths and trampling of vegetation within LWS. As part of the planning application (APP/C1570/W/20/3256109) a woodland management and recreation strategy (condition 14) which provides advertised walking routes, woodland management (including footpaths) and dog bin facilities will provide a package of appropriate mitigation for recreational effects.
- 4.14** Notwithstanding, Alsa Woods LWS is c.450m away by foot with public footpaths present through and around the perimeter of the site. A network of local footpaths also exists in the local area and along the northern perimeter of the application Site which will act to reduce the pressure on the LWS. Given the distance of the

LWSs and the network of local footpaths leading immediately from the Site which will act to disperse footfall in these areas, it is considered that increased recreational disturbance is likely to have a negligible impact on the nature conservation value of the LWS and no further mitigation is required.

4.15 Lady Wood/Regent's Spring LWS is 2km away and Wilkins Plantation LWS is 2.7km away by foot. There are a number of alternative public footpaths closer to the Site which are more likely to be utilised by the residents of the proposed development. It is therefore considered unlikely that there will be significant additional recreational impacts to Lady Wood/Regent's Spring LWS and Wilkins Plantation LWS resulting from this development.

4.16 The mitigation proposals for Hatfield Forest SSSI will also mitigate for any recreation effects on these sites. It is therefore considered that a **neutral** residual effect on these non-statutory sites is predicted.

Rare and Notable Flora

4.17 Field horsetail although not non-native is invasive and it is recommended that it is removed before construction commences due to its propensity to spread adversely impact created habitats. A further invasive species survey and eradication plan is recommended.

Habitats

4.18 The development will result in the permanent loss of species poor arable field and the section of improved grassland.

4.19 Extensive areas of public open space (POS) are to be created to the west and east of the Site. This has the potential to create additional wildlife habitat through the use of species-rich native seed mixes (such as Emorsgate EM8 within wet areas such as SuDS and tussocky grass mix EM10) planting of scrub around the boundaries and planting of native trees throughout the development. It is further recommended that new native species rich hedgerows are included on the east and northern boundaries. This can be managed to promote species diversity through a Landscape and Ecology Management Plan (LEMP).

Biodiversity Net Gain

4.20 There are currently no policies regarding biodiversity net gain (BNG) in Uttlesford District Councils Local Plan, however the National Planning Policy Framework (MHCLG, 2021) states, under paragraph 174, that developments should:

b) Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

Baseline ecological value of the Site

4.21 The baseline of the existing habitats was translated between the phase 1 JNCC categories and UKHabitats classification and assigned a distinctiveness, condition and strategic significance score which is set out in Table 7 below.

Table 7: Phase 1 to UKHabitats translation and associated scores

JNCC Phase 1	UKHabitats	Distinctiveness	Condition	Strategic significance
J1.1 – Cultivated arable land	Cereal crops	Medium	N/A - Agricultural	Area/compensation not in local strategy/ no local strategy
B4 - Improved grassland	Modified grassland	Low	Poor	Area/compensation not in local strategy/ no local strategy

4.22 For both area habitats of cultivated arable land and improved grassland neither have a condition score and are both considered to not be related to any specific local strategy.

Proposed development value of the Site

4.23 The proposed development is still in early stages of design at this outline stage however, certain aspects of the design are known such as areas to the west and east of the Site will be designated as area of open space that can be designed to benefit wildlife.

4.24 A high-level calculation utilising the latest biodiversity metric (DEFRA 3.1) was undertaken. This was completed based on a number of assumptions listed here:

1. The planned public open space throughout the development will be modified grassland managed to a moderate condition and the area surrounding the SUDs will be other neutral grassland seeded with species rich grassland mix such as Emorsgate EM8 and managed to a 'moderate' condition.
2. The urban areas are assumed to be 70% developed land; sealed surface and 30% vegetated gardens.
3. Urban tree planting is based on the Illustrative Layout and assumed that 50 trees will be of a 'small' size and 50 will be of a 'medium' size and will be managed to a 'moderate' condition.

4.25 An audit of losses and gains in the existing and proposed habitats identified that a measurable net gain can be delivered. According to the current Illustrative Layout, the development will result in a net gain of 2.52 habitat units (12.67%). The headline results are provided in Table 8 and the BNG metric calculation can be found in Appendix 13.

Table 8: Biodiversity Net Gain Metric 3.1 Headline Results.

On-site baseline	<i>Habitat units</i>	19.89
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	<i>Habitat units</i>	22.41
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
On-site net % change (Including habitat retention, creation & enhancement)	<i>Habitat units</i>	12.67%
	<i>Hedgerow units</i>	0.00%
	<i>River units</i>	0.00%
Off-site baseline	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	<i>Habitat units</i>	2.52
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	<i>Habitat units</i>	12.67%
	<i>Hedgerow units</i>	0.00%
	<i>River units</i>	0.00%
Trading rules Satisfied?	Yes ✓	

- 4.26** Further enhancements for biodiversity are considered feasible within the proposed development such as the recommended addition of native species rich hedgerow planting on the east and northern boundaries. This would facilitate in achieving a net gain for linear habitats and it is recommended that this is included within the detailed landscape plans.
- 4.27** It is recommended that a Biodiversity Net Gain Design Stage Report is produced in conjunction with the detailed landscape plan in order to fully assess the biodiversity net gains as a result of the development and provide detailed suitable mitigation and enhancement measures in line with the National Planning Policy Framework (MHCLG, 2021). It is further recommended that a Landscape and Ecological Management Plan (LEMP) is produced alongside the Biodiversity Net Gain Design Stage Report which will detail how the created habitats will be maintained and achieve their proposed conditions within the targeted time.
- 4.28** It is considered that the implementation of mitigation measures (details of which will be provided in a Biodiversity Net Gain Design Stage Report) will likely result in a **positive** residual effect on BNG.

Protected and Notable Species

Badger

- 4.29** Badgers are legally protected under the Protection of Badgers Act (1992).
- 4.30** Sensitive information regarding the location of badger setts has been redacted from this report due to confidentiality issues regarding the protection of badgers. It is highly unlikely that a main sett is present on the site due to the lack of obvious well-worn tracks and spoil heaps.
- 4.31** Before construction works commence it is recommended that a further badger survey is conducted to ascertain if badger sett building activity within 30m of the development zone of the Site has occurred.
- 4.32** To mitigate any potential impacts to commuting and/or foraging badgers during the construction phase such as death and/or injury the following precautionary techniques that are sympathetic to badgers are additionally recommended:
- 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 workday to prevent animals from entering and becoming trapped;
 - Covering chemicals and appropriately storing them overnight; and
 - Regular removal of litter.
- 4.33** These mitigation measures will result in a **neutral** effect on badgers.

Bats

- 4.34** The potential commuting and foraging habitats along the adjacent hedgerow to the west is planned to be retained under the current proposals.
- 4.35** There is still potential for foraging and commuting bats to be adversely affected by the development at the construction and occupation phases through increases in artificial lighting. Bat activity surveys are not considered proportionate to the likely impacts of the scheme in this instance providing effects such as lighting can be mitigated by sensitive lighting design.
- 4.36** To enable bats to continue to utilise the adjacent hedgerow corridor, a sensitive lighting strategy is recommended to be in place for the occupational phase that avoids directly lighting the adjacent hedgerow and the canopies of trees. The following general 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 and provide guidance for the development of a suitable scheme:
- In general, light sources should not emit ultra-violet light so as 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 component. Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).
- The height of lighting columns should be limited to eight meters and increasing the spacing of lighting columns (Fure, 2006) can reduce spill of light into unwanted areas such as the 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 and be passive infrared 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.

4.37 The effect of lighting during the construction phase can be mitigated by working within day light hours only. If night-time working is required lights facilitating the works should be directed away from boundary treelines and hedgerows in order to maintain a dark corridor.

4.38 The Site will be enhanced for bats through the planting of flora known to be favoured by their prey species (Appendix 14) and the inclusion of traditional bat boxes integrated within new buildings. Ten bat boxes are recommended to be integrated into buildings as part of the development and landscape design to provide opportunities for roosting bats on Site post-development. A variety of bat boxes that can integrate seamlessly into the design of new buildings are available, such as the Habibat Bat Box (Figure 1), which can be supplied plain for a rendered finish, or faced with brick.

Figure 1: Habibat Bat Box faced with red brick, incorporated within wall at gable end.



4.39 Bat boxes should be sited at a minimum 3m height, with a clear uncluttered flight path to the box. Integrated boxes in buildings should be sited in properties close to the western boundaries of the development. Ideally, they would be installed with a variety of orientations, including south-facing, high up on gable ends or directly under the eaves.

4.40 It is predicted that the above mitigation and enhancements would result in a **positive** residual effect for bats.

Birds

4.41 The development will potentially cause the destruction and disturbance of skylark territories, which constitutes an offence under The Wildlife and Countryside Act 1981 (as amended). In addition, construction will lead to loss nesting and foraging habitats for skylark (arable land).

4.42 Surveys were conducted for Phase 1 of the development to the south of Site by SES in 2021. They identified 3 skylark territories (Appendix 7). One of which was in the same arable field as phase 2 of the development (the Site). The phase 1 site was c.20Ha whereas the Phase 2 site is smaller c.9.8 ha (developable area) but with similar habitat (arable fields). A public right of way on the western boundary of the Site would potentially cause disturbance to nesting skylarks. Furthermore, hedgerows with trees bound the western edges of the arable field which skylarks tend to avoid nesting close to (Europa, 2019). It is therefore considered reasonable to assume that only two skylark territories are present on Site, however because no surveys have been conducted on Site a precautionary 3rd territory should be accounted for as a reasonable worst-case scenario.

4.43 To mitigate for the loss of skylark territories it is recommended that a one-off mitigation payment to a local conservation organisation or appropriate third party to create and manage skylark plots on suitable local arable land with sympathetic farmers. Created plots will be located within suitable habitat and will follow the current agri-environmental prescriptions as set out under the Countryside Stewardship Scheme 'AB4: Skylark plots' (Appendix 8) with fields subject to continued arable use. Auditing of plots will be undertaken every other year for a period of 10 years post creation. Auditing will be undertaken by a suitably qualified ornithologist to ensure compliance.

4.44 To enhance the Site further for nesting birds artificial nesting opportunities are recommended to be integrated into properties in line with BS 42021:2022 (British Standards Institution, 2022). A ratio of 1:1 bird boxes to new dwellings integrated into buildings to support species including starling *Sturnus vulgaris*, great tit *Parus major*, blue tit *Cyanistes caeruleus*, house sparrow *Passer domesticus*, and swift *Apus apus*. Examples of integrated boxes can be found in Figure 2 and 3. Nest boxes should be installed with a northerly orientation to create a cool nesting environment and minimise the risk of chicks overheating. Swift boxes should be installed on buildings at 4-5m with a clear flight line directly below the eaves of properties. The locations of boxes should be grouped within the scheme due to the colonial nesting nature of these species, to facilitate likelihood of uptake.

Figure 2: Manthorpe Swift Brick (integrated)



Figure 3: 1SP Schwegler Sparrow Terrace (integrated)



- 4.45 It is predicted that the above mitigation and enhancements would result in a **neutral to positive** residual effect for birds.

Invertebrates

- 4.46 The Site is considered unlikely to support significant assemblages of rare or notable invertebrates due to the common habitats present and restricted variety and density of micro-habitats available however the Site does partially fall within the B-line network. As such, no further surveys are recommended to adhere to wildlife legislation or planning policy.
- 4.47 It is recommended that the scheme includes new areas of landscaping of value to a range of invertebrates, including moths and pollinators such as wildflower/ tussock grassland which would also contribute towards the B-line network that the Site falls within. Further enhancements for invertebrates could incorporate planting a range of flowering ornamental species, the inclusion of night-scented lower planting such as honeysuckle *Lonicera sp.* and jasmine *Jasminum officinale* would also attract moths in the evening, which would in turn attract foraging bats. A list of appropriate plants is provided in Appendix 14.
- 4.48 These measures could result in a **positive** residual effect at Site level for invertebrates.

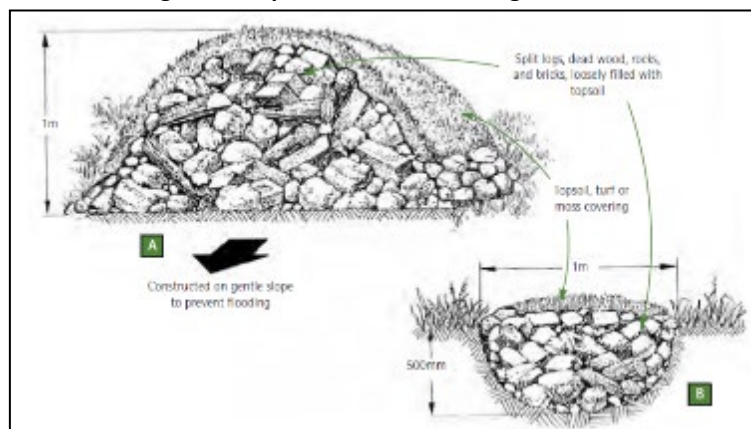
Reptiles

- 4.49 Suitable habitat on Site (improved grassland) for reptiles is to be lost as part of the extension of the station carpark in association with this development. Despite no reptiles being recorded during the reptile surveys on Site, the semi-improved grassland is directly ecologically connected to an area where reptiles were recorded adjacent to Site. As such, it is considered that small numbers of reptiles could utilise the habitat on Site.
- 4.50 To mitigate for the risk of killing and/or injury to reptiles during construction, staged habitat removal will be undertaken following sensitive methods and timings prior to the construction stage to remove suitable reptile habitat from the Site and therefore limit the likelihood of reptiles being present on the Site during construction. Habitat manipulation will take place under a method statement sensitive to reptiles which will detail avoidance measures.
- 4.51 Prior to the start of works, all vegetation clearance contractors will receive a reptile awareness toolbox talk and a briefing on any other potential ecological constraints present on Site. This briefing will include details of legal protection of reptiles, the precautionary methods of working to be implemented, identification of reptiles

and procedures to be followed. Vegetation clearance activities will take place in conditions for reptiles to be active and will be overseen by an Ecological Clerk of Works (ECoW). It will involve the directional strimming of all areas of suitable habitat in two stages to allow any reptiles present to move out of the working/construction area naturally.

- 4.52** To reduce the residual risk of harm to any reptiles remaining within the impacted suitable habitats post strimming, a targeted destructive search supervised by an ECoW will be undertaken. The destructive search will involve potential reptile habitat being slowly scraped by an excavator using a toothed bucket while an ecologist supervises and safely removes any reptiles 'scraped-up' in the bucket or disturbed on the ground (Gent & Gibson, 2003). Discrete features such as log piles and tree stumps will be dismantled by hand.
- 4.53** Reptiles are unlikely to access the Site during the construction phase as the habitats will not be optimal. However, construction stockpiles such as timber stacks and rubble piles would be favourable shelter for reptiles such as common lizard. Therefore, in order to prevent reptiles accessing the Site during the construction phase and being accidentally harmed it is recommended that a reptile fence is installed along the northern perimeter of the Site to exclude and disperse any reptiles from potentially entering the construction zone. Appendix 12 illustrates the proposed location of the reptile fence.
- 4.54** The creation of new species rich wildflower grasslands and areas of mixed scrub will provide new suitable habitat within the Site for reptiles and will provide connectivity to the wider environment, fostering colonisation of the Site post development. Log-pile hibernacula (Figure 4) buffered by long-grass areas should also be created to reduce likelihood of predation post-occupation.

Figure 4: Reptile hibernacula design



- 4.55** It is considered that the creation of hibernacula, provision of open space on Site with areas of wildflower grassland and mixed scrub will result in a **positive** residual effect on local populations of reptiles.

Other Notable Species

- 4.56** Potential impacts to hedgehog, brown hare, harvest mouse and common toad include risk of death and/or injury during construction and habitat loss (semi-improved grassland) and de-vegetation of the arable field. For the clearance of the semi-improved grassland precautionary measures as for reptiles (Section 4.49) should be followed to reduce risk of direct harm. In addition to this, sensitive timings for works e.g. outside of hedgehog hibernation season (November-March) and a search for hedgehog, harvest mice nests and brown hare is to be undertaken prior to clearance. Precautionary measures recommended for badgers (e.g. covering

trenches overnight or provision of a mammal ladder), will also protect hedgehogs and brown hare during construction.

- 4.57** To retain access into the Site for hedgehogs post-development, it is recommended that garden boundaries are either defined by permeable hedgerows, or hedgehog highways are added to garden fences by creating *ad hoc* 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; installing hedgehog friendly fencing (Figure 4Figure 5); removing a brick at the bottom of a wall or cutting a hole in fencing/walls.

Figure 5: Hedgehog friendly fencing



- 4.58** A **neutral to positive** residual effect for hedgehog would be expected to be achieved through these measures and a neutral residual effect for brown hare, harvest mouse and common toad.

5.0 Conclusions

5.1 Overall, the Site was considered to be of low ecological value. It is considered that the Site may provide suitable habitat for a number of protected and/or notable species. A summary of likely impacts and mitigation is provided in **Table 7**.

Table 7. Summary of likely impacts, mitigation and enhancement measures and residual impacts.

Feature	Likely Impacts	Further Surveys	Likely Mitigation and Enhancement Measures	Residual Effect
SSSI	Indirect in-combination effects; increased recreational pressure	N/A	Contribution to Hatfield Forest SAMMs and provision of suitable alternative open space on site with connection to offsite walking routes. Installation of information boards advertising these routes with dog waste bins and information leaflets to new residents.	Neutral
LWS	N/A	N/A	Provision of mitigation as per above	Neutral
Habitats	Habitat loss	Biodiversity Net Gain Design Stage Report. LEMP	Inclusion of wildflower grassland, mixed scrub and tree planting within the scheme Biodiversity net gain of 12.67% predicted	Positive
Badger	Information redacted.	N/A	Information redacted. Prestart badger walkover survey Precautionary measures.	Neutral
Bats	Disturbance of adjacent commuting and foraging corridor from artificial lighting	N/A	Sensitive lighting; Bat box scheme Bat friendly planting scheme	Positive
Birds	Destruction and/or damage of active nests	N/A	Creation of offsite skylark plots by 3 rd party provider Works undertaken outside of breeding bird season or after nest search Bird box scheme	Positive
Invertebrates	N/A	N/A	Wildlife friendly planting	Positive
Reptiles	Death and/or injury	N/A	Reptile Method Statement Exclusion fencing during construction phase Precautionary clearance methods Creation of log pile hibernacula	Positive
European hedgehog, brown hare, harvest mouse and	Injury/death during construction	N/A	Precautionary measures Hedgehog highways	Neutral to positive

Feature	Likely Impacts	Further Surveys	Likely Mitigation and Enhancement Measures	Residual Effect
common toad				

5.2 Through the above mitigation, a wildlife friendly landscaping scheme, sensitive practices/management during construction and occupation and precautionary methods as suggested, it is considered that all significant impacts upon 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, 2021); and Uttlesford District Councils local plan policies with regard to biodiversity (UDC, 2005) (now withdrawn).

6.0 References

Bloor Homes (2022). Illustrative Layout Drawing number: J0045323_007

British Standards Institution (2022). BS 42021:2022: Integral nest boxes — Selection and installation for new developments — Specification. London: British Standards Institution

Buglife (2021). B-Lines. [REDACTED]

Butcher B, Edmonds R, Norton L and Treweek J (2020). The Uk Habitat Classification User Manual Version 1.1 at <http://www.ukhab.org/>

CIEEM (2017) *Guidelines for Preliminary Ecological Appraisal 2nd edition*. Chartered Institute of Ecology and Environmental Management: Winchester.

CIEEM (2022) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management: Winchester.

Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Edition*. The Bat Conservation Trust: London.

DEFRA (2018). National Pollinator Strategy: Implementation Plan, 2018-2021 [Online]. Available at:
[REDACTED]

Eaton, M., Aebischer N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. & Gregory, R. (2015) Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, **108**, 708-746.

Edgar, P., Foster, J. and Baker, J. (2010) *Reptile Habitat Management Handbook*. Amphibian and Reptile Conservation: Bournemouth.

Europa (2009). Skylark *Alauda arvensis*: Factsheet. EU Wildlife and Sustainable Farming project. [Online]. Available at -
<https://ec.europa.eu/environment/nature/natura2000/management/docs/Alauda%20arvensis%20factsheet%20-%20SWIFI.pdf>

FPCR (2014) *The Fairfield Partnership (Elsenham) Ltd. East of Elsenham. Badger Survey Report*. Unpublished report to The Fairfield Partnership (Elsenham) Ltd.

FPCR (2017) *The Fairfield Partnership (Elsenham) Ltd. East of Elsenham. Ecological Appraisal*. Unpublished report to The Fairfield Partnership (Elsenham) Ltd.

Froglife (1999). *Reptile Survey: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Froglife: Peterborough.

Fure, A. (2006) *Bats and Lighting*. The London Naturalist, No. 85.

Hundt, L. (2012) *Bat Surveys: Good Practice Guidelines 2nd Edition*. The Bat Conservation Trust: London.

Institution of Lighting Professionals (2018) *Guidance Note 08/18: Bats and Artificial Lighting in the UK*. Institution of Lighting Professionals: Warwickshire.

JNCC (2010) *Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit*. ISBN 0 86139 636 7.

Jones, J. (2000) *Impact of Lighting on Bats*. The Bat Conservation Trust: London.

Ministry of Housing, Communities and Local Government (MHCLG) (2021) *National Planning Policy Framework*. [Online]. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

Natural England (2019) Emerging strategic approach relating to the Hatfield Forest Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR). Interim advice pending the examination of emerging Local Plans. Ref: HatFor Strategic Interim LPA, 5th April 2019 [Online]. Available at: https://www.efdclocalplan.org/wp-content/uploads/2019/05/ED66-Hatfield_Forest_SSSI_NNR_Interim_Strategic_LPA_Advice_Letter.pdf

Natural England (2022). Biodiversity Metric 3.1 Auditing and accounting for biodiversity user guide. Natural England.

Oldham, R.S., Keeble, J., Swan, M.J.S and Jeffcote, M. (2000) *Herpetological Journal*. Vol. 10, pp. 143-155.

Place Services (2018). *Essex Coast Recreational Disturbance Avoidance & Mitigation Strategy- Habitats Regulations Assessment Strategy Document 2018-2038*

Southern Ecological Solutions (2020). *Appendix C.1: Phase 2 Ecological Surveys and Evaluation Update; Land West of Elsenham, Essex*. Unpublished

Southern Ecological Solutions (2021). *Ecological Impact Assessment - Land East of Elsenham, Essex*. Unpublished.

Southern Ecological Solutions (2021a). *Skylark Mitigation Strategy- Land East of Elsenham, Essex*. Unpublished.

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

Stone E.L., Jones G., Harris S. (2012) Conserving energy at a cost to biodiversity? Impacts of LED lighting on bats. *Glob. Change Biol.* 18, 2458-2465.

Uttlesford District Council (2005). Uttlesford Local Plan, Adopted January 2005.

Wilson J and Browne S (1993) Habitat Selection and Breeding Success of Skylarks *Alauda arvensis* on organic and Conventional Farmland. BTO Research Report No. 129. British Trust for Ornithology, Thetford, Norfolk.

Appendix 1: Site Plans

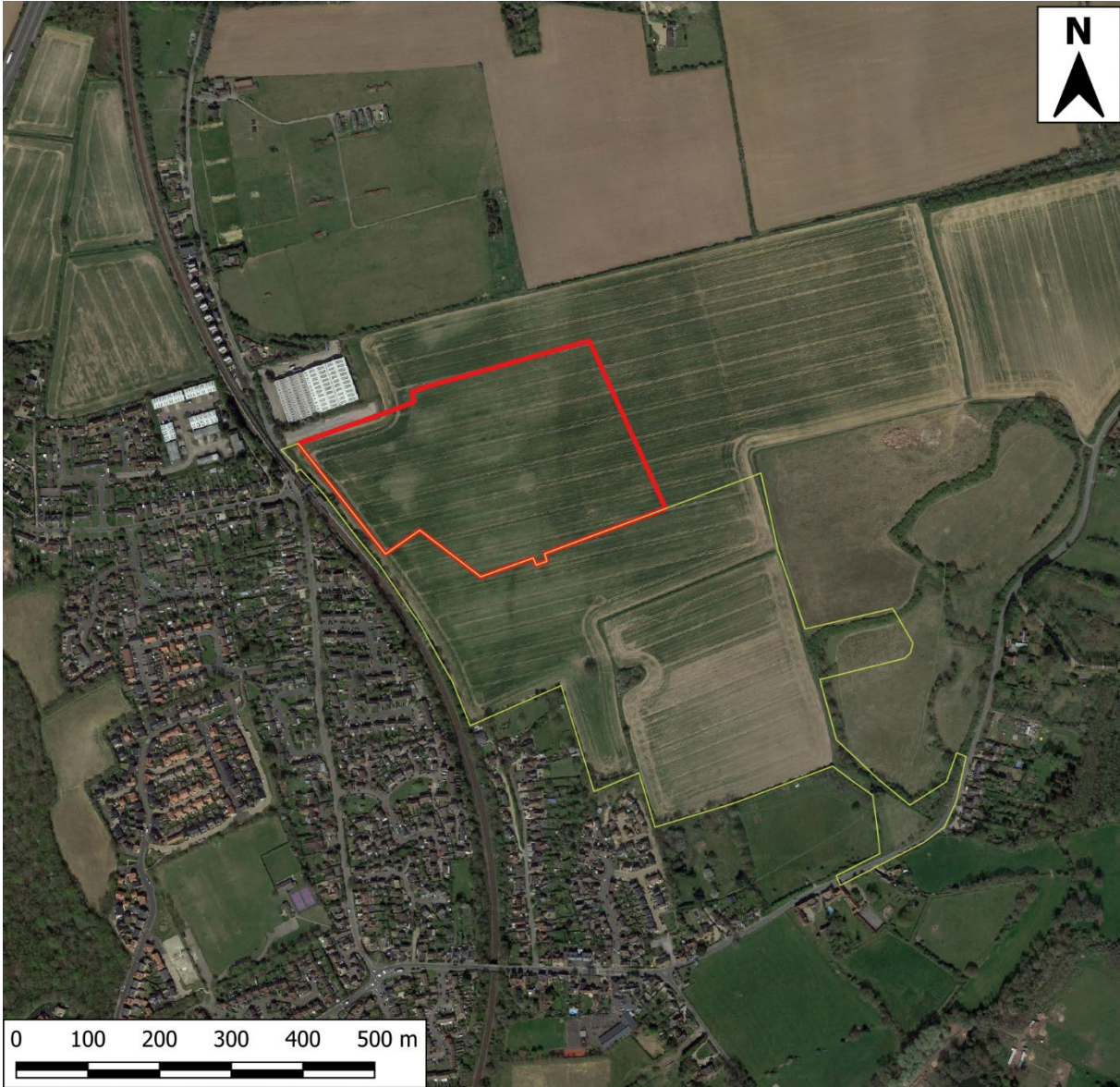
Site Location Plan





Illustrative Layout (Drawing number: J0045323_007 (Bloor Homes, 2022))



Site Context Plan



Key

-  Phase 1 Site Boundary
-  Phase 2 Site Boundary



Land East of Station Road, Elsenham (Phase II)
Site Context Plan
Date: September 2022
Map data: Google, QuickMapServices © 2021

Appendix 2: 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) outlines what the planning system should do to contribute to and enhance the natural and local environment through the following policy statements:

Paragraph 8

Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

- c) an environmental objective – to contribute to protecting and enhancing our natural, built, and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

Paragraph 20

Strategic policies should set out an overall strategy for the pattern, scale, and quality of development, and make sufficient provision for:

- d) conservation and enhancement of the natural, built, and historic environment, including landscapes and green infrastructure, and planning measures to address climate change mitigation and adaptation.

Paragraph 28

Non-strategic policies should be used by local planning authorities and communities to set out more detailed policies for specific areas, neighbourhoods, or types of development. This can include allocating sites, the provision of infrastructure and community facilities at a local level, establishing design principles, conserving, and enhancing the natural and historic environment and setting out other development management policies.

Paragraph 102

Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

- d) the environmental impacts of traffic and transport infrastructure can be identified, assessed, and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and

Paragraph 118

Planning policies and decisions should:

- a) encourage multiple benefits from both urban and rural land, including through mixed use schemes and taking opportunities to achieve net environmental gains – such as developments that would enable new habitat creation or improve public access to the countryside.
- b) recognise that some undeveloped land can perform many functions, such as for wildlife, recreation, flood risk mitigation, cooling/shading, carbon storage or food production.

Paragraph 141

Once Green Belts have been defined, local planning authorities should plan positively to enhance their beneficial use, such as looking for opportunities to provide access; to provide opportunities for outdoor sport and recreation; to retain and enhance landscapes, visual amenity, and biodiversity; or to improve damaged and derelict land.

Paragraph 170

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) 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 174

To protect and enhance biodiversity and geodiversity, plans should:

- a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and steppingstones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

Paragraph 175

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.

Paragraph 176

The following should be given the same protection as habitats sites:

- a) potential Special Protection Areas and possible Special Areas of Conservation.
- b) listed or proposed Ramsar sites.
- c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

Paragraph 177

The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects) unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

Paragraph 180

Planning policies and decisions should also ensure that new development is appropriate for its location considering the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes, and nature conservation.

Local Planning Policy

Uttlesford Local Plan – Adopted 2005 (Withdrawn 2022)

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 ENV6 – Change Of Use of Agricultural Land to Domestic Garden

Change of use of agricultural land to domestic garden will be permitted if the proposal, particularly its scale, does not result in a material change in the character and appearance of the surrounding countryside. Conditions regulating development rights associated with the proposal may be necessary.

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 (The Habitats Regulations 2017) that deals with internationally important sites and species, and the Wildlife and Countryside Act (WCA) 1981 that deals with nationally important sites and species.

Certain habitats and species within discrete sites are protected as SSSI under the WCA 1981. A proportion of these are more strictly protected as proposed or designated SPA, SAC and Ramsar sites under the Conservation of Habitats and Species Regulations (2017). These designations protect features and resources listed as being of international importance from both direct and indirect effects arising from a range of issues including proposed development. In addition, non-statutory designated sites (e.g. Local Wildlife Sites) are 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 (great crested newt) *Triturus cristatus*, hazel dormouse *Muscardinus avellanarius* and otter *Lutra lutra*

are also protected under Schedule 2 of the Habitats Regulations 2010 making them European Protected Species (EPS). Taken together it is illegal to:

- Deliberately kill, injure or capture any wild animal of EPS;
- Deliberately disturb wild animals of any EPS in such a way to be likely to significantly affect:
- The ability of that species to survive, breed, rear or nurture their young; or
- The local distribution of that species.
- Recklessly disturb an EPS 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 EPS, unless acquired legally; and/or
- Sell, barter or exchange any part of an EPS.

A range of species other than birds, including water vole *Arvicola amphibius*, is 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 3: Detailed Methods

Badgers

Surveys were carried out using standard guidelines for classifying badger setts and categorising entrance holes (Harris *et al.*, 1989; Scottish Badgers, 2018; Natural England, 2009). The survey comprised a detailed systematic walkover survey of the site with signs of badger noted. The badger signs looked for were:

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

Preliminary Bat Assessment

All potential roosting habitats (existing buildings and trees) were assigned a level of suitability according to the descriptions outlined in the table below. Trees and building exteriors were assessed from ground level, using binoculars where necessary to identify potential roost features and bat access points. Evidence of bat occupation sought included the physical presence of bats, droppings, urine staining and mammalian fur oil staining. The site as a whole was also assigned a level of suitability for foraging and commuting bats according to the descriptions outlined below.

Table A3.3. 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>

Suitability	Roosting habitats	Commuting and foraging habitats
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 1km² of survey pond
- Terrestrial habitat quality
- Macrophyte cover

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

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 A3.1).

Table A3.1 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 A3.2 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

Reptiles

Artificial refuges (0.5m x 0.5m felt squares) were laid in suitable habitat, using the surveyor's professional judgement. Artificial refuges were used to observe reptiles basking or taking refuge, these were laid in transects and left for fourteen days to settle before the survey commenced. Guidance recommends laying mats at density of 10p/ha of suitable habitat (Froglife, 1999), however in this case a larger number of mats 65 for approximately 0.2ha of suitable habitat) were laid to provide adequate coverage of all suitable areas.

A total of seven visits for the presence/likely absence survey were undertaken during 'suitable' days for reptile activity; a 'suitable' survey day is determined by the weather, with temperature being the pre-eminent factor. Reptile surveys conducted between 9 and 18°C have the most chance of success and therefore all surveys were undertaken in these temperatures.

As presence was detected a categorical population assessment was carried out with the largest count within the first seven visits indicating the category of the recorded reptile species. This count was adjusted to determine the population class due to enhanced survey effort. The table below details the assessment categories:




Table A3.9. Froglife reptile population assessment.

Species	Low Population	Good Population	Exceptional Population
Common Lizard	<5	5-20	>20
Slow-Worms	<5	5-20	>20
Grass Snake	<5	5-10	>10
Adder	<5	5-10	>10

Appendix 4: Phase 1 Survey Plan



Key

-  B4 - Improved grassland
-  J1.1 - Cultivated/disturbed land - arable
-  Red Line Boundary



Land East of Station Road, Elsenham
(Phase II)

Phase 1 Habitat Plan

Date: September 2022

Map data: Google, QuickMapServices ©
2021

Appendix 5: Plant Species

Table A5: Plant Assemblages Recorded during Phase 1 Habitat Survey

Common name	Scientific name	Improved grassland
Ash	<i>Fraxinus excelsior</i>	R
Bramble	<i>Rubus fruticosus</i>	F
Bristly oxtongue	<i>Picris echioides</i>	F
Cock's-foot	<i>Dactylis glomerata</i>	A
Common bent	<i>Agrostis capillaris</i>	F
Common nettle	<i>Urtica dioica</i>	O
Dock sp.	<i>Rumex sp.</i>	O
Dog rose	<i>Rosa canina</i>	O
Elder	<i>Sambucus nigra</i>	D
Field horsetail	<i>Equisetum arvense</i>	F
Ground ivy	<i>Glechoma hederacea</i>	R
Hawthorn	<i>Crataegus monogyna</i>	R
Ivy	<i>Hedera sp.</i>	R
Perennial rye-grass	<i>Lolium perenne</i>	R
Ragwort	<i>Jacobaea vulgaris</i>	R
Ribwort plantain	<i>Plantago lanceolata</i>	O
Sow thistle	<i>Sonchus spp</i>	R
Sycamore	<i>Acer sudoplantanus</i>	R
Yorkshire fog	<i>Holcus lanatus</i>	F

Appendix 6: Site Photographs

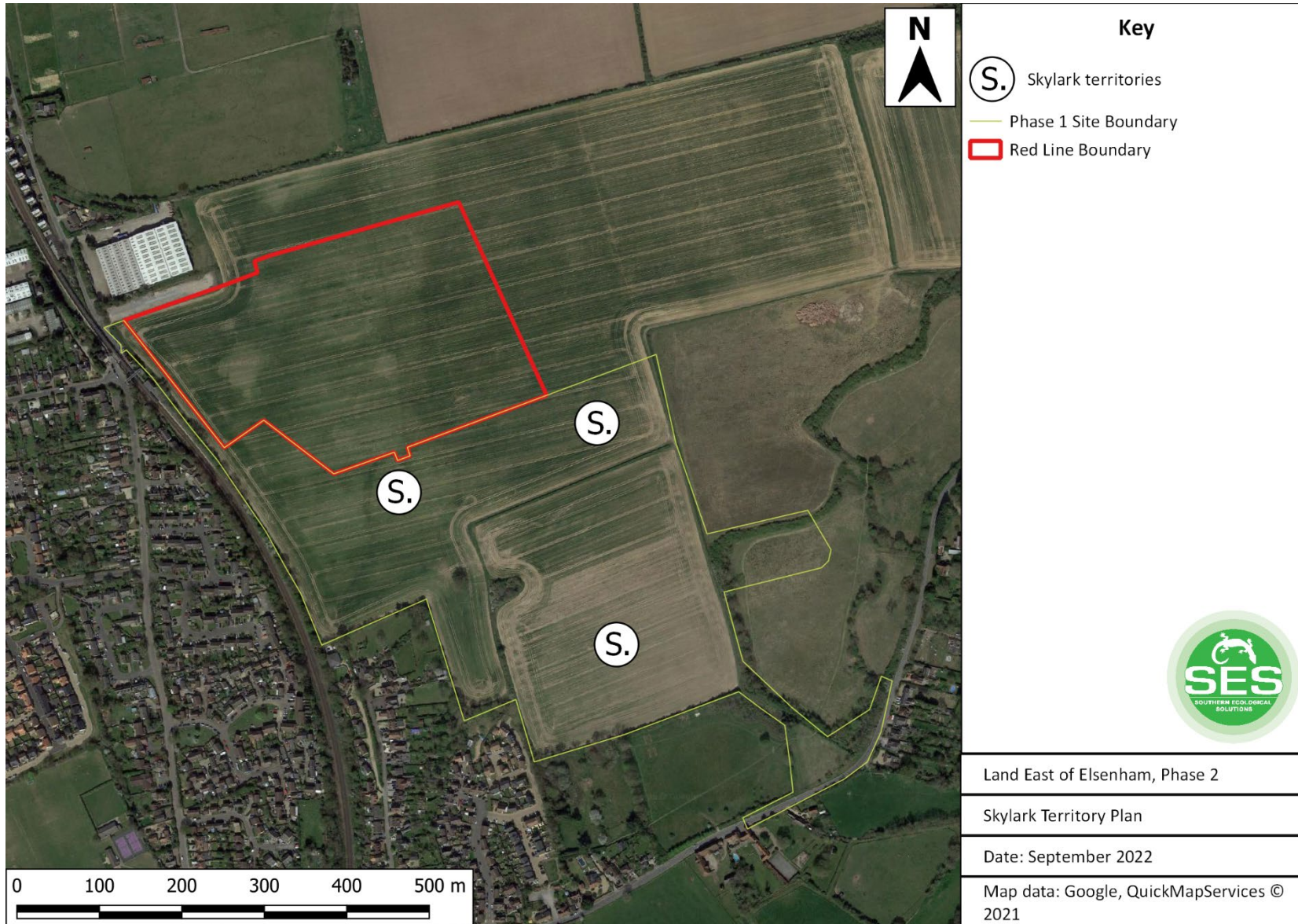
Photo 1: Arable field



Photo 2: Arable field with improved grassland



Appendix 7: Skylark Territory Plan





for birds
for people
for ever

FARMING FOR WILDLIFE

Skylark plots



Skylark plots are undrilled patches created by briefly switching off the drill when sowing winter cereals.

Skylark plots are undrilled patches in winter cereal fields. They have been proven to boost nesting opportunities for skylarks in areas of predominantly autumn-sown crops. If spring crops are not a main feature of your rotation, this is an important measure to conserve skylark numbers.

BENEFITS FOR WILDLIFE

Skylark plots increase the number of chicks that skylarks can rear in winter cereals.

Winter cereal fields with skylark plots hold more nesting skylarks throughout the breeding season than conventional cereal fields, especially late in the season when numbers in conventional fields tail off as the crop becomes taller and thicker.

On average, nests in fields containing skylark plots produce more chicks than those in conventional fields. Skylark chicks that fledged in fields with skylark plots are also heavier, suggesting that they are better fed and more likely to survive the winter.

Skylarks do not generally nest in the skylark plots, but instead use them for foraging. In a conventional winter cereal field,

skylarks can forage easily in April but, by June, more than half of the foraging has to take place outside the field. If adjacent fields also contain winter crops, skylarks will struggle to find sufficient food. However, in fields with two skylark plots per hectare, they continue to forage easily within the field throughout the season.

GUIDELINES OVERLEAF

CREATION OF SKYLARK PLOTS

It is best to create skylark plots in fields that are to be sown with winter cereals. The fields should be more than 5 ha in size and have an open aspect. Fields bounded by trees or adjacent woods are not suitable unless they are larger than 10 ha.

Skylark plots are created by switching off the drill (or lifting it up) to create undrilled patches at least 3 m wide. Aim for each plot to be between 16 m² and 24 m². The table below indicates the ideal plot length for plots created with different drill widths. A tail-off of cereal grain in the plot after the drill has been switched off or lifted up is to be expected.

Guidance on the ideal plot length in relation to the width of the drill

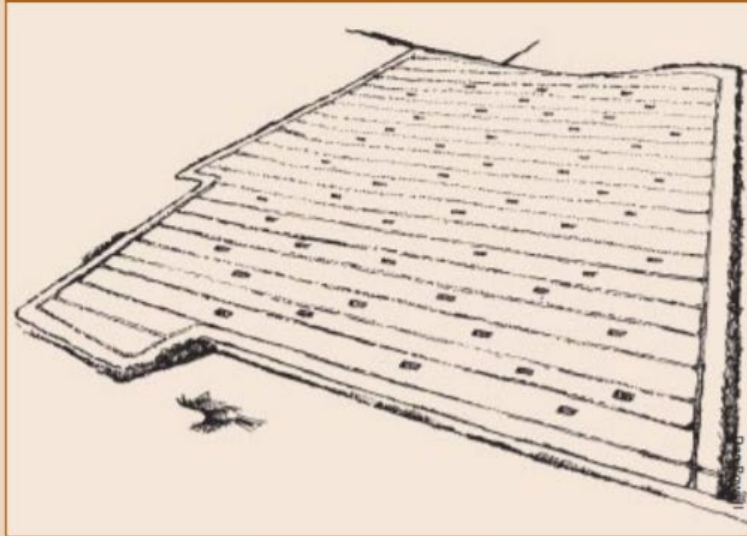
Drill width (m)	Plot length (m)
3	6 to 8
4	4 to 6
6	3 to 4
8	3

The ideal number of plots in a field is two per hectare. They should not be connected to the tramlines and should be sited away from field boundaries and telegraph poles. They should be at least 24 m from the edge of the field. Typical plots of 4 x 5 m will take up less than half of 1% of the field area.

No further action is necessary – skylark plots will receive the same sprays and fertiliser applications as the rest of the field. If you have concerns about difficult weeds,

such as black grass or wild oats, arising within the plot, you can control them using a knapsack sprayer – although this was rarely required in skylark plot trials.

A 25-hectare winter cereal field should ideally contain about 50 plots scattered across it. The plots should not be within 24 metres of the field edge or connected to the tramlines.



KEY POINTS

- Skylark plots are easily created by switching off the drill to create undrilled patches of at least 3 m in length.
- Fields with two skylark plots per hectare have been shown to have significant benefits for skylarks.
- Skylark plots are an option in the new Entry Level Scheme.

The Entry Level Scheme can fund the creation of skylark plots in England. You can get further information on this and other ways of managing your farm for wildlife from:



Agricultural Adviser, The RSPB, UK Headquarters, The Lodge, Sandy, Bedfordshire SG19 2DL. Tel: 01767 680551 www.rspb.org.uk

RSPB regd charity no 207076



www.saffie.info



Farming and Wildlife Advisory Group, NAC, Stoneleigh, Kenilworth, Warwickshire CV8 2RX. Tel: 02476 696699



The Game Conservancy Trust, Fordingbridge, Hampshire SP6 1EF. Tel: 01425 652381



The RSPB is the UK charity working to secure a healthy environment for birds and wildlife, helping to create a better world for us all.

223-0989-04-05

Appendix 9: GCN Survey Results

Waterbodies Plan within 250m

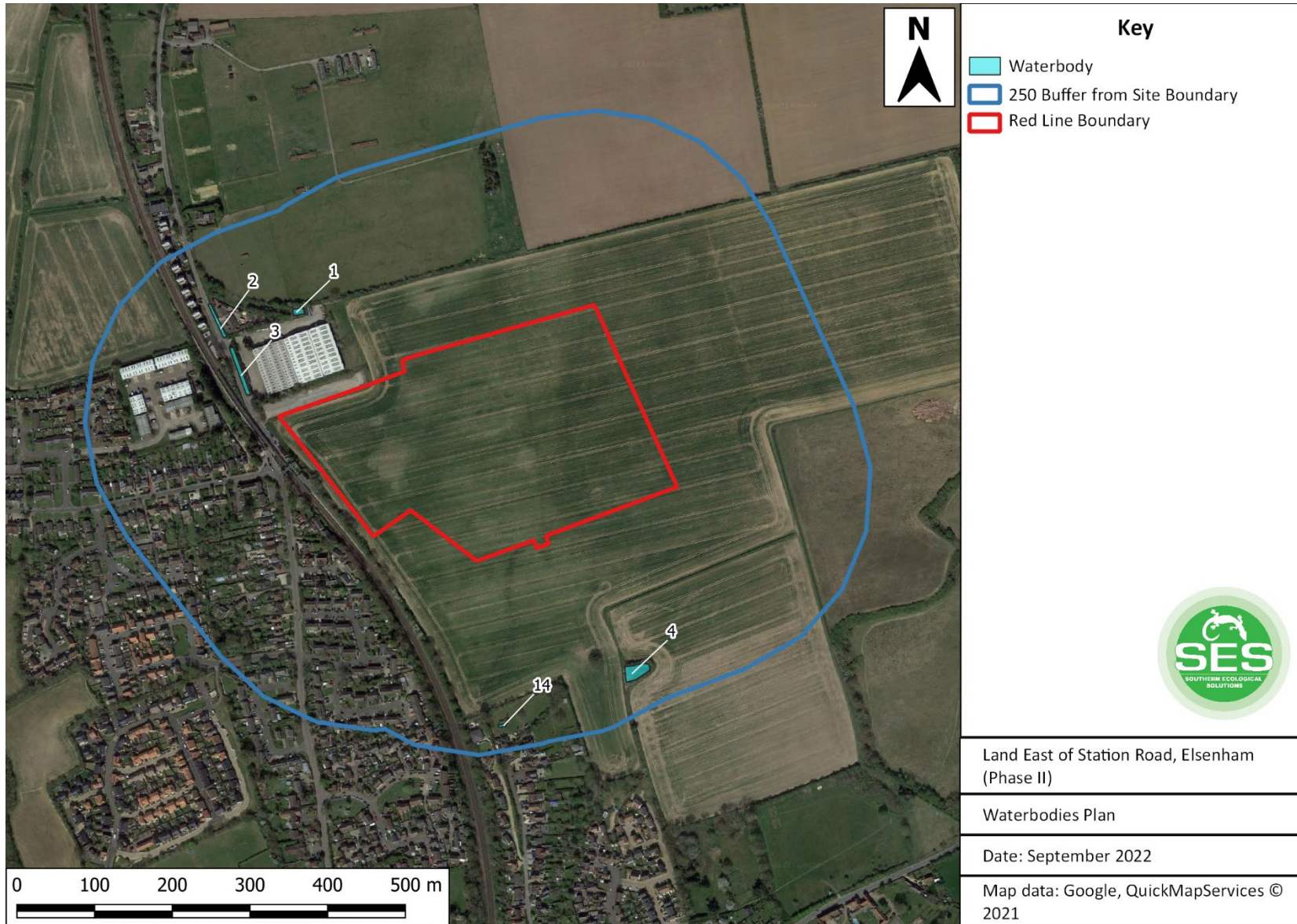


Table A10: Detailed HSI survey results.

Pond ID	SI ₁	SI ₂			SI ₃		SI ₄		SI ₅		SI ₆		SI ₇		SI ₈		SI ₉			SI ₁₀		HSI
	Location	Pond Area (m ²)			Pond Drying ¹		Water Quality ²		Shade		Fowl ³		Fish ⁴		Ponds		Terrestrial Habitat ⁵			Macrophytes		
1	UNSUITABLE (DRY)																					
2	UNSUITABLE (DRY)																					
3	UNSUITABLE (DRY)																					
4	A	1	100	0.15	R	1	P	0.33	90%	0.3	Ab	1	Abs	1	>12	1	P	0.33	40%	0.7	0.57	Average
14	UNSUITABLE (LINED)																					
1 Pond Drying: N = Never; R = Rarely; S = Sometimes; A = Annually.				2 Water Quality: G = Good; M = Moderate; P = Poor; B = Bad.				3 Fowl: A = Absent; Mi = Minor; Ma = Major.				4 Fish: A = Absent; P = Possible; Mi = Minor; Ma = Major.				5 Terrestrial Habitat: G = Good; M = Moderate; P = Poor; N = None.						

Appendix 10a – eDNA Survey Results (April 2021)

Pond 4

Client: Laura Bennett,
SES Eco



ADAS
Spring Lodge
172 Chester Road
Helsby
WAG 0AR

Tel: 01159 516747

Email: [REDACTED]

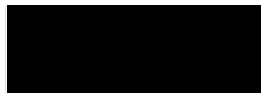
www.adas.uk

Sample ID: ADAS-1281 Condition on Receipt: Good Volume: Passed
Client Identifier: Elsenham Description: pond water samples in preservative
Date of Receipt: 29/04/2021 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	04/05/2021
Degradation Control [‡]	Within Limits	Real Time PCR	04/05/2021
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	04/05/2021
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [§]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:



Signed:



Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 11/05/2021 Date of issue: 11/05/2021

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

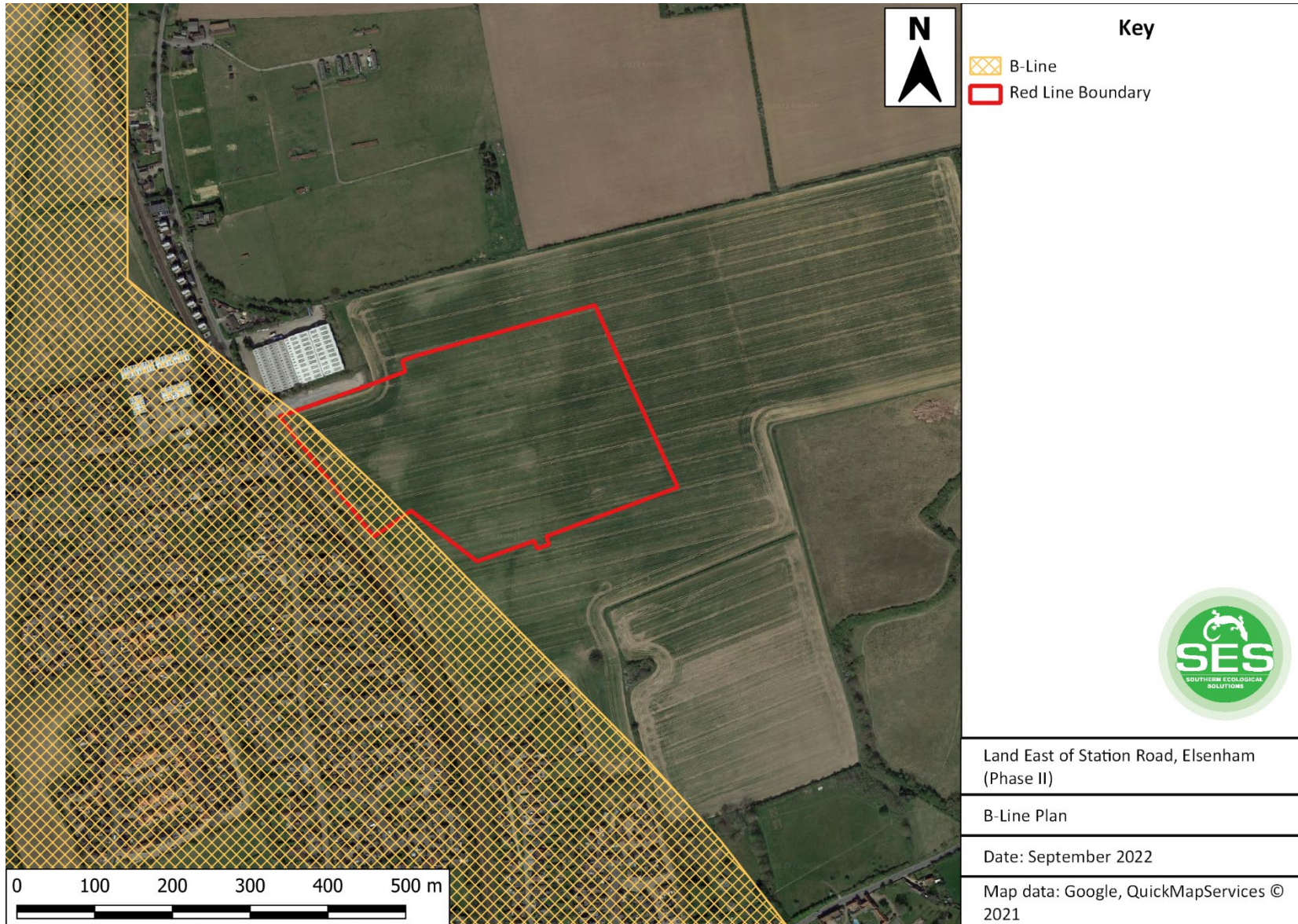
** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[‡] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[§] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Appendix 10: B-lines

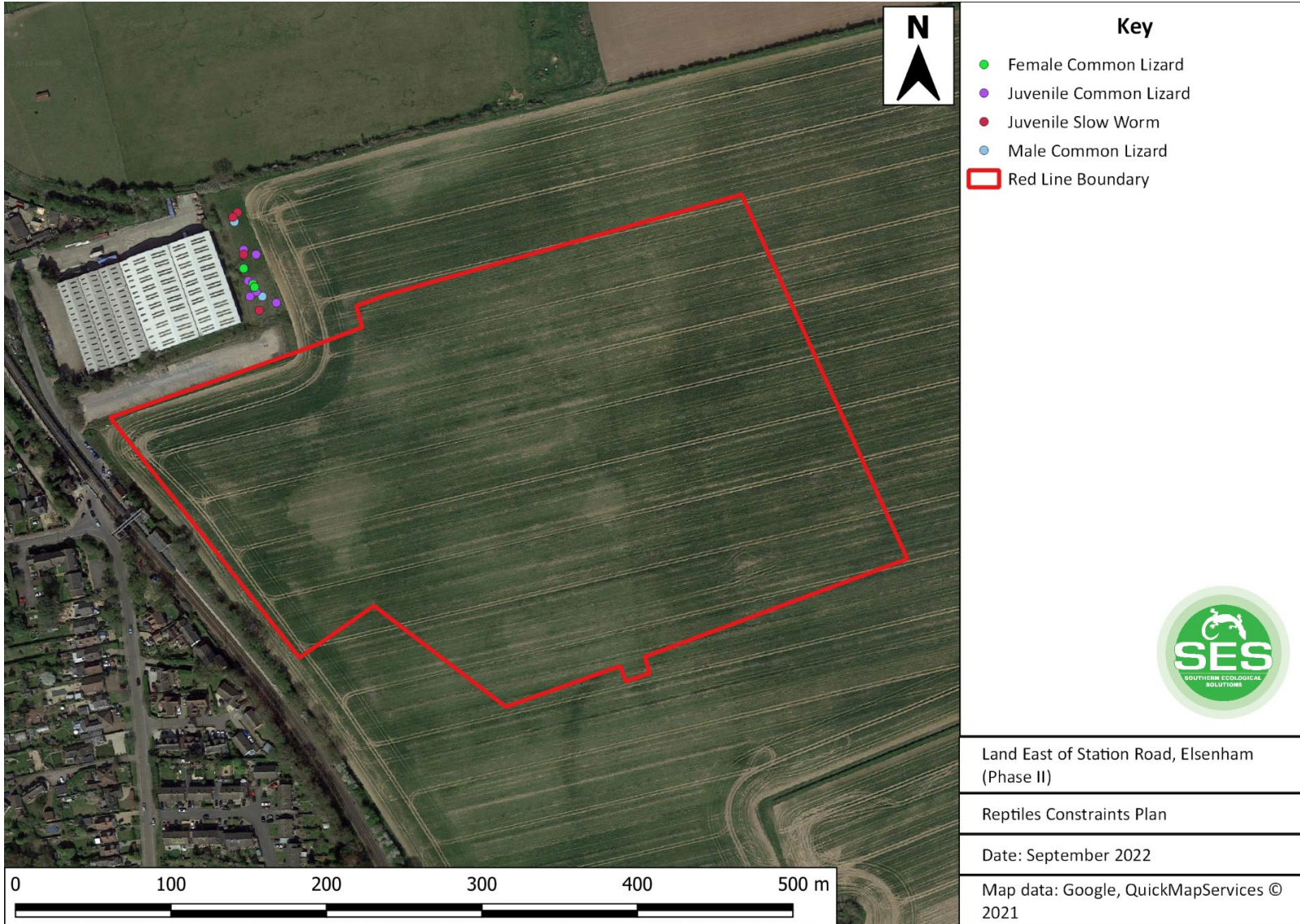


Appendix 11: Reptile Survey Results
Reptile Survey Results Summary Table

Visit 1		Visit 2		Visit 3		Visit 4		Visit 5		Visit 6		Visit 7	
Date	21/09/2021	Date	23/09/2021	Date	25/09/2021	Date	27/09/2021	Date	29/09/2021	Date	01/10/2021	Date	04/10/2021
Surveyor	PSN	Surveyor	JS	Surveyor	PSN	Surveyor	JS	Surveyor	RG	Surveyor	JS	Surveyor	VWW
Start time	1715	Start time	12:30	Start time	1615	Start time	12:15	Start time	13:00	Start time	15:30	Start time	12:30
Start temp C	17	Start temp	17	Start temp	19	Start temp	16.5	Start temp	15	Start temp	15.5	Start temp	14
End time	1745	End time	13:10	End time	1647	End time	13:00	End time	13:20	End time	16:10	End time	13:15
End temp C	17	End temp	17	End temp	19	End temp	17	End temp	15	End temp	15.5	End temp	14
Cloud cover (%)	50	Cloud cover (%)	30	Cloud cover (%)	80	Cloud cover (%)	75	Cloud cover (%)	80	Cloud cover (%)	80	Cloud cover (%)	90
Wind (Beaufort)	0	Wind (Beaufort)	2	Wind (Beaufort)	3	Wind (Beaufort)	3	Wind (Beaufort)	3	Wind (Beaufort)	3	Wind (Beaufort)	3
Rain	N	Rain	N	Rain	N	Rain	N	Rain	N	Rain	N	Rain	N
Suitable weather? (Enter Y/N)	Y	Suitable weather? (Enter Y/N)	Y	Suitable weather? (Enter Y/N)	Y	Suitable weather? (Enter Y/N)	Y	Suitable weather? (Enter Y/N)	Y	Suitable weather? (Enter Y/N)	Y	Suitable weather? (Enter Y/N)	Y
Record	OS Grid Ref	Record	OS Grid Ref	Record	OS Grid Ref	Record	OS Grid Ref	Record	OS Grid Ref	Record	OS Grid Ref	Record	OS Grid Ref
1 JCL	TL5340527154	1 MCL	TL5339627192	2 FCL	TL5342327140	1 MCL	TL5340927150	5 MCL	TL5340227174	2 MCL	TL5340927150	4 FCL	TL5340227171
1 JCL	TL5340827153	3 FCL	TL5340227162	3 JCL	TL5342327140	3 JCL	TL5340927150	6 FCL	TL5340227174	5 FCL	TL5340927150	2 JCL	TL5340627144
		2 JSW	TL5341227135	3 MCL	TL5341427144	2 JSW	TL5339527195	2 JCL	TL5340227174			1 JSW	TL5340227171
				2 JCL	TL5341027147								
				4 JCL	TL5340827152								
				1 FCL	TL5340827152								
				2 JCL	TL5341027171								
				1 JSW	TL5339827198								

Key: JCL = Juvenile common lizard, MCL = Male common lizard, FCL = Female common lizard, JSW = Juvenile slow worm

Reptile Survey Results Plan



Appendix 12: Reptile Fence Plan



Appendix 13: Biodiversity Net Gain Metric 3.1

Biodiversity Metric 3.1 Calculations appended separately

Appendix 14: Plant Species of Known 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	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 saooaharum</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
<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

Plant species	Common name	Native (N)	Type	Benefit	Soil	Light	Green roofs	Living walls	Rain gardens	Hedge/ trees	Beds/ borders
<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
<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

Plant species	Common name	Native (N)	Type	Benefit	Soil	Light	Green roofs	Living walls	Rain gardens	Hedge/ trees	Beds/ borders
<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		