



Ecological Impact Assessment

Land at Birch Avenue, Bacton, Suffolk

On Behalf Of:

Bellway Homes (Eastern Counties)

August 2021

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Executive Summary

1. Southern Ecological Solutions Ltd (SES) were commissioned by Bellway Homes Ltd (Eastern Counties) to carry out an Ecological Impact Assessment (EclA) at land off Birch Avenue, Bacton, Suffolk. This report presents the findings and recommendations of previous ecological surveys and an update ecological walkover survey undertaken to inform a full planning application for residential development of the site.
2. The site was approximately 4.8ha in total and dominated by arable land with perimeter grassland margins, hedgerows and trees. Urban development was present to the north of the site while arable land extended away on all other aspects. Outline planning permission for up to 85 dwellings was granted in June 2020. The reason a reserved matters application is not being submitted is because in order to address local concerns with the main access, the red line boundary has been changed which requires a full application to be submitted. However, the assessment carried out in the outline permission are still relevant consideration.
3. One site of national importance was identified as a Site of Special Scientific Interest (SSSI) within 5km at approximately 4.4km south-east. The site does not fall within any Natural England Impact Risk Zones where residential developed is considered likely to impact any statutorily designated sites and therefore no adverse impacts are likely. In addition, there were two sites of local importance however given their distances no direct/indirect impacts are anticipated.
4. The habitats on site were species-poor, common and widespread. The sites native hedgerows qualified as Habitats of Principle Importance (HPI) under the NERC Act 2006 while other habitats of value included mature broadleaved trees. Habitats of value will be retained and enhanced. Additional habitats including Sustainable Urban Drainage (SUDS), neutral grassland, hedgerows and trees will be incorporated into the scheme to compensate for the loss of habitat to the proposals.
5. The habitats have potential to support a number of protected/priority species and further surveys were undertaken for bats and great crested newts (GCN) *Triturus cristatus* in 2018 (Greenlight Environmental Consultancy). An assemblage of predominantly common and widespread bat species were identified utilising the site for foraging/commuting with activity concentrated along the site's western boundary. In addition, a low population of GCN were identified approximately 250m west of the site.
6. Mitigation measures for protected/priority species are detailed within this report. They include the retention and enhancement of existing boundary habitat, recommendations for a wildlife sensitive lighting scheme, the creation of offsite skylark plots and precautionary methods of vegetation removal. A Biodiversity Enhancement Plan (See Appendix 7) has been produced and includes the creation of semi-natural habitats and provision of bird and bat boxes along with hibernacula for reptiles and amphibians. Through implementation of the recommended measures, it is considered that all impacts from the proposed development upon protected and notable habitats and species would be mitigated in line with relevant wildlife legislation and national and local planning policy related to biodiversity.

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1.0 Introduction

- 1.1** Southern Ecological Solutions Ltd. (SES) was commissioned by Bellway Homes (Eastern Counties) to undertake an Updated Phase 1 Habitat Survey of land at Birch Avenue, Bacton, Suffolk (the site) (Appendix 1) in order to inform this Ecological Impact Assessment (EclA). The site was located centrally at Ordnance Survey Grid Reference TM 05694 66986 and approximately 4.8ha in size, comprised predominantly of arable land. This report presents the findings and recommendations of ecological surveys undertaken to inform the full planning application for residential development of the site.
- 1.2** The proposal is for residential development of 85 dwellings including access on Birch Avenue, siting for a potential new community building, and a children's play area.

Previous Ecological Surveys and Reports

- 1.3** An Ecological Impact Assessment was undertaken by Greenlight Environmental Consultancy in 2018. This covered the application site and a wider area immediately to the south of the site. At the time of this survey, the site was dominated by arable land with improved grassland margins and hedgerows considered to qualify as Habitat of Principle Importance (HPI) under the NERC Act 2006. Habitats on site were noted as suitable for a range of protected/priority species and further surveys undertaken for bats and great crested newt (GCN) *Triturus cristatus*.
- 1.4** None of the trees on the site had potential to support roosting bats. Nocturnal bat activity surveys were undertaken which identified activity on the site by predominantly common and widespread bat species concentrated along the western boundary. Further GCN surveys identified a low population of GCN over 250m from the site. A number of recommendations for mitigation and enhancement were made including a sensitive lighting scheme for bats, installation of bat and bird boxes, removal of woody vegetation outside of the bird breeding season/under supervision of an ecologist, creation of skylark plots in adjacent arable fields, sensitive removal of vegetation to minimise impact on GCN and reptiles and the installation of hibernacula. All recommendations have been incorporated into this report. Further details are also provided in the accompanying Landscape and Ecology Management Plan (Golby and Luck, 2021).
- 1.5** Due to the time elapsed since the initial survey work relating to the outline planning permission, an updated ecological walkover survey was undertaken in order to assess any potential changes to the ecology of the site in the intervening years and allow for appropriate mitigation measures to be recommended.
- 1.6** The objectives of the update ecological walkover survey undertaken in January 2021 by SES 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;
 - 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 (NPPF) (MHCLG, 2019); and
 - Ensure that the Suffolk Biodiversity Validation requirements (2019) were met.

- 1.7 The study area as shown within Appendix 1 was defined by the proposals, desk study, relevant wildlife legislation (Appendix 2) and Zones of Influence relating to specific species and designated sites.

Site Description

- 1.8 The site was located to the south of Birch Avenue, Bacton, Suffolk. It was approximately 4.8 ha in area and comprised predominantly of arable land with grassland margins and hedgerows. Other habitats included an area of poor semi-improved grassland in the north of the site, ditches and scattered trees. Urban development associated with the village of Bacton lies to the north while arable land extends away in all other directions. An active railway line was also present along the south-eastern boundary.

2.0 Methods

- 2.1 The following EclA follows guidance and methods as prescribed by the Chartered Institute for Ecology and Environmental Management (CIEEM) *Guidelines for Ecological Appraisal 2nd edition* (2017) and the *Guidelines for Ecological Impact Assessment* (2018) (Appendix 3). Following these methods, a baseline of rare and/or noted ecological receptors (species and habitats) was established and valued. Predicted significant impacts upon these receptors have been identified and constraints and opportunities identified. This step-wise assessment process has informed likely mitigation and enhancement measures. This will fully inform the predicted impacts of the scheme in accordance with the *National Planning Policy Framework* (NPPF) (MHCLG, 2019), local planning policy and relevant wildlife legislation.

- 2.2 CIEEM guidelines for Ecological Assessment in the United Kingdom (2018) have been utilised to assess the impacts upon habitats within the zone of influence of the site. CIEEM suggests that it is best to use the geographical scale (i.e. international, national, regional etc.) at which a feature (i.e. a habitat, species or other ecological resource) may or may not be important as the appropriate measure of value. As such, data from the data search, extended Phase 1 Habitat survey and subsequent species-specific surveys has been reviewed and the likely occurrence of protected and notable species/species groups assessed. This has allowed predictions of impacts to be made along with recommendations for mitigation, compensation and enhancement.

- 2.3 The following geographical scale categories are considered appropriate:

- International;
- National (*i.e.* England);
- Regional (South East);
- County (Suffolk);
- District (Mid Suffolk);
- Local or Parish (Bacton); and
- Within Site or zone of influence only

Desk Study

- 2.4 SES commissioned a data search for records of protected and notable species within 2km of the site as well as non-statutory designated sites from Suffolk Biodiversity Information Service (SBIS). The data was received in January 2021. Hazel dormice *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).

- 2.5** A web-based search for statutory designated sites via the Multi Agency Geographic Information for the Countryside (MAGIC) spatial data resource www.magic.gov.uk was undertaken on 01 February 2021 for the following designations: European (up to 10km from the site boundary); national (5km from the site boundary); and local (2km from the site boundary).
- 2.6** 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 and mobile species such as bats and birds.
- 2.7** The previous Ecological Impact Assessment by Greenlight Environmental Consultancy (2018) was also reviewed as part of this assessment.

Extended Phase 1 Habitat Survey

- 2.8** An updated extended Phase 1 Habitat Survey was carried out on 26 January 2021 by suitably qualified senior ecologist Molly Dailide in 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* (Joint Nature Conservation Committee (JNCC), 2010). Habitat mapping was undertaken using the standard classification to indicate habitat types.
- 2.9** The dominant and readily identifiable higher plant species identified in each of the various habitat parcels were recorded and their abundances assessed on the DAFOR scale:
- D - Dominant
 - A - Abundant
 - F - Frequent
 - O - Occasional
 - R - Rare
- 2.10** These scores represent the abundance within the defined area only and do not reflect national or regional abundances. Plant species nomenclature follows Stace (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.

Protected and Notable Species

Badger

- 2.12** An initial assessment was made to identify areas that might be used by badgers *Meles meles* for foraging, commuting and sett creation.

Bats

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

2.14 Good bat foraging habitat generally includes sheltered areas and habitats with good numbers of insects, such as woodland, scrub, ponds, lakes and species-rich or rough grassland. Good commuting habitat generally comprises linear features such as well-connected hedgerows, woodland edge and watercourses. The site was assigned a level of suitability according to the descriptions outlined in Table 2.

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

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

Birds

2.15 The site was assessed for its potential to support breeding birds. Suitable habitat generally includes scrub, trees and ruderal vegetation but can also include buildings, open grassland and piles of debris.

2.16 The site was also assessed for its potential to support significant wintering and/or migratory bird populations.

Great Crested Newt

2.17 Any aquatic and terrestrial habitats were assessed for their suitability for great crested newts (GCN) *Triturus cristatus*. Suitable terrestrial habitat generally includes rough grassland and woodland where they can forage

and hibernate, with good links to the ponds where they breed.

Reptiles

- 2.18** The site was assessed for its suitability for the four commoner 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 lizard favor rough grassland, however they can be found in a variety of habitats ranging from woodland glades to walls and pastures. Slow-worms use similar habitats to common lizards and are often found in gardens and derelict land. Grass snake have similar habitat requirements to common lizards but have a greater reliance on ponds and wetlands where they hunt amphibians. Adders occupy areas of rough, open countryside and are often associated with woodland edge habitats.

Hazel Dormice

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

Invertebrates

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

Other Notable Species

- 2.21** 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.

Constraints

- 2.22** Desktop data searches are a valuable tool in evaluating a site's potential to hold rare and protected species, it is not however an absolute in confirming presence or absence of notable species due to the nature of how the records are collected.
- 2.23** The survey was undertaken in January and therefore outside of the optimum plant growing season. As such a number of plant species may not have been present or identifiable. Given the presence of common and widespread habitat within the site and as the original survey was undertaken in May, this was not considered a significant constraint.

3.0 Baseline ecological conditions

Desk Study

Statutory/Non-statutory Sites

- 3.1 There was a single statutory site of national importance within 5km of the site. Gipping Great Wood Site of Special Scientific Interest (SSSI) was located c. 4.4km south-east and notified for its ancient coppice-with-standard wood. All nationally designated sites are considered to be of value at a **national** level. The site falls within the outer SSSI IRZ for Gipping Great Wood however due to the distance from the SSSI, residential development is not listed on the IRZ as a likely impact on the designated site.
- 3.2 There were no statutory sites of local importance within 5km of the site. Two non-statutory designated sites were identified within 2km of the site. These were both County Wildlife Sites (CWS) designated primarily for their species-rich grassland and included: Cow Green 1.2km south-east and Topcroft Farm Meadows 1.1km north from the site. The LWSs are considered important at a **county** level.

Protected/Priority Species

- 3.3 A summary of the records of species protected in the UK by Regulation 41 of the Conservation of Habitats and Species Regulations (Habitats Regulations) (CHSR) 2017 is provided in Table 2 below.

Table 2. Habitats Regulations Protected Species within 2km of the site.

Species	Total no. Records	Date of Most Recent Record	Location of Nearest Record
Noctule <i>Nyctalus noctula</i>	1	2010	2.7km NW
Pipistrelle <i>Pipistrellus</i> species	7	2018	300m NW
Brown long-eared bat <i>Plecotus auritus</i>	2	2014	1.6km NW
Otter <i>Lutra lutra</i>	1	2012	1.5km NW
Daubenton's Bat <i>Myotis daubentonii</i>	1	2010	2.7km NW
Natterer's Bat <i>Myotis nattereri</i>	1	2010	2.7km NW

- 3.4 Species in the UK protected within one or more of the following: Wildlife and Countryside Act (WCA) 1981 (as amended) and the Protection of Badgers Act 1992; Species listed on the Natural Environment and Rural Communities (NERC) Act 2006 (previously UK biodiversity Action Plan (BAP) species) Section 40 and 41 found within 2km of the site are summarised in Table 3 below. Details of bird records are provided in the following relevant section.

Table 3. Other UK Protected Species within 2km of the site.

Species	Total no. Records	Date of Most Recent Record	Location of Nearest Record
UK Protected Species			
Badger <i>Meles meles</i>	1	2019	400m NE
Slow worm <i>Anguis fragilis</i>	2	2018	700m SW
Grass snake <i>Natrix natrix</i>	1	2018	700m SW
NERC Act Species			
Brown hare <i>Lepus europaeus</i>	1	2019	1.5km NW
West European Hedgehog <i>Erinaceus europaeus</i>	45	2019	300m W

Protected/Priority Habitats

- 3.5 No priority habitats were identified within the site during the desk study search of Magic Map. A number of priority woodland habitats were found within 1km with the nearest located 200m south-west of the site.

Habitats

- 3.6 Habitats within the site were predominantly arable with boundary vegetation including grassland margins, hedgerow, ditches and trees. A low number of brush piles were also present along the boundaries (TN1). The Phase 1 Habitat map is provided within Appendix 4, and the plant species recorded per habitat type are tabled in Appendix 10. Site plates are illustrated in Appendix 11.

Arable

- 3.7 The site was dominated by arable land. The northern-most part of the site appeared unmanaged and while the majority was bare ground, a number of grass and forb species were scattered throughout including common nettle *Urtica dioica*, bristly oxtongue *Helminthotheca echioides*, cleavers *Galium aparine*, meadow grass *Poa* sp, spear thistle *Cirsium vulgare*, meadow foxtail *Alopecurus pratensis*, willowherb *Epilobium* sp, and cock's-foot *Dactylis glomerata*. The majority of the site had very little botanical diversity however some common arable weeds including round-leaved fluellen *Kickxia spuria* and sharp-leaved fluellen *Kickxia elatine* were present.

Poor Semi-improved Grassland

- 3.8 Areas of poor semi-improved (modified) grassland were present along the northern, eastern and western boundaries. These were unmanaged and approximately 1-2m wide. The margins were dominated by coarse, tussock forming grass species including cock's-foot and false oat grass *Arrhenatherum elatius*. Other species present included bramble *Rubus fruticosus* agg, cleavers *Galium aparine*, yarrow *Achillea millefolium*, common nettle *Urtica dioica*, cow parsley *Anthriscus sylvestris* and ground ivy *Glechoma hederacea*.
- 3.9 An additional area of poor semi-improved grassland was present in the north of the site in an area of existing public open space. Perennial rye-grass *Lolium perenne* was abundant with frequent annual meadow-grass *Poa annua*, white clover *Trifolium repens*, daisy *Bellis perennis*, creeping buttercup *Ranunculus repens* and red fescue *Festuca rubra*. Other forbs present included ribwort plantain *Plantago lanceolata*, dandelion *Taraxacum officinale* agg., common mallow *Malva sylvestris* and common mouse-ear *Cerastium fontanum*.

Scattered Scrub

- 3.10 Limited pockets of scattered scrub were noted along the site boundaries. Species present included bramble, blackthorn *Prunus spinosa*, elder *Sambucus nigra* and field maple *Acer campestre*.

Scattered Trees

- 3.11 A low number of scattered ash *Fraxinus excelsior* and field maple trees were located along the northern, eastern and western boundaries of the site.

Hedgerows

- 3.12** A number of hedgerows were present along the site's boundaries. With the exception of non-native garden hedges along the northern boundary these were all considered Habitats of Principle Importance (HPI) under the NERC Act 2006 due to the presence of native species. Despite this, none of the hedgerows qualified as 'Important' under the Hedgerows Regulations Act 1997 due to low species diversity and limited associated species. The hedgerows are described below.
- 3.13** Hedgerow H1 was located in the north-eastern boundary of the site adjacent the railway. It was an intact species-poor hedgerow of predominantly blackthorn and hawthorn *Crataegus monogyna* approximately 2-3m x 1m.
- 3.14** Hedgerow H2 was present along the south-eastern boundary and was a defunct species-poor hedgerows c.2x1m. Species present included ash, elder, willow *Salix* sp. and field maple.
- 3.15** H3 was 4x1m and located along the north-western boundary. The hedgerow was intact species-poor comprised of field maple, ash, elder and blackthorn with numerous trees. A ditch was present along its length and a parallel hedgerow approximately 5m west.
- 3.16** H4 was located along the northern boundary to the south of the existing area of public open space. It was dominated by hawthorn with occasional field maple and ash. The hedgerow was unmanaged and outgrown at 4x1m.

Introduced Scrub

- 3.17** A section of introduced scrub along the northern boundary was present dominated by laurel *Laurus nobilis* that has spread from the boarding housing development.

Summary

- 3.18** The habitats within the site were noted as species-poor during the survey and considered common and widespread. The habitats on site are assessed as being of **site** level value with high confidence in this assessment.

Protected and Notable Species

Rare and Notable Plants

- 3.19** No rare or notable plants were identified on the site during the survey however this was carried out at a sub-optimal time of year. The original survey was undertaken in May 2018 and no notable/rare plants were identified at this time.
- 3.20** There were no records of Schedule 9 invasive plant species on or immediately adjacent the site. No Schedule 9 invasive species were recorded on site during the survey.

Badger

- 3.21** There was a single record of badger within 2km of the site from 2019.
- 3.22** No setts were identified within the site or immediate surroundings where accessible. No other evidence of

badger was identified within the site including latrines, snuffle holes or footprints. This was consistent with previous findings (Greenlight Environmental Consultancy 2018).

- 3.23** The arable land, grassland margins and hedgerows onsite provided foraging and commuting habitat for this species with connectivity to the wider landscape to the south.
- 3.24** The site is assessed as being of **site** value for badgers given the lack of field signs and abundance of similar habitat in the immediate surroundings and confidence in this assessment is currently high.

Bats

- 3.25** There were twelve records of bats provided by the records centre. These included seven records for pipistrelle species, two for brown long-eared bat and single records for noctule, Daubenton's and Natterer's bats. Records were not requested from the bat group due to the lack of roosting and limited foraging and commuting habitats on site.
- 3.26** Ground level assessments were undertaken of all trees within/bordering the site. No trees within/bordering the site had features with potential to support roosting bats.
- 3.27** The arable land on site offered limited opportunities for foraging bats. The hedgerows along the northern and eastern boundaries were scattered and defunct while the southern boundary lacked any linear features suitable for commuting bats. The western boundary comprised an intact hedgerow with trees which extended north and south and provided potential foraging and commuting opportunities for bats.
- 3.28** Previous bat activity surveys on the site (and wider area to the south) in 2018 recorded a low-high level of bat activity, predominantly from common pipistrelle and soprano pipistrelle with one pass each from barbastelle and *Myotis* sp. The activity was concentrated along the site's western boundary. The static surveys recorded additional species including brown long-eared and serotine with the majority of activity also along the western boundary and predominantly from pipistrelle species with what was considered a small number of individual barbastelle frequently commuting along the western boundary.
- 3.29** Given the habitats present and previous survey findings, the site is considered to be valued at **site** level of importance for bats and confidence in this assessment is high.

Birds

- 3.30** There were a large number of bird records returned from within 2km of the site including several red-listed birds of conservation concern (BoCC) (Eaton *et al.* 2015); skylark *Alauda arvensis*, house sparrow *Passer domesticus*, corn bunting *Emberiza calandra*, yellowhammer *Emberiza citrinella*, linnet *Linaria cannabina*, grey wagtail *Motacilla cinerea*, yellow wagtail *Motacilla flava*, grey partridge *Perdix perdix*, marsh tit *Poecile palustris*, starling *Sturnus vulgaris*, song thrush *Turdus philomelos*, fieldfare *Turdus pilaris* and mistle thrush *Turdus viscivorus*. Additionally, skylark, fieldfare, redwing, brambling *Fringilla montifringilla* and hobby *Falco subbuteo* were recorded within 2km and are species listed under *Schedule 1* of the *Wildlife Countryside Act (WCA) 1981*.
- 3.31** The arable land and perimeter vegetation are considered likely to be suitable for a variety of urban edge species and farmland species of conservation concern such as skylark, yellowhammer and linnet. In addition, the site may provide suitable foraging opportunities for foraging wintering birds such as red listed farmland birds

including fieldfare and redwing *Turdus iliacus*.

3.32 Skylark were recorded onsite during the previous phase 1 survey in 2018 and the resulting report concluded that the size of the site (approximately 5ha) was suitable for 1-2 breeding pairs.

3.33 Given the common and widespread habitats and the limited size of the site, the site is considered to be important at the **site** level for breeding and wintering birds and confidence in this assessment is high.

Great Crested Newt

3.34 There were no records of GCN identified within 2km from the site.

3.35 The majority of the site was of negligible value to terrestrial phase GCN within areas of arable land. The grassland margins, hedgerows and brash piles (TN1) provided some potential foraging, commuting, rest/shelter and hibernation opportunities however these were limited in area.

3.36 There were no water bodies within the site however 20 waterbodies were identified within 500m of the site of which five were located within 250m (Appendix 6). Of those present within 500m, ponds P1, P2, P4-P6 and P8 were previously assessed in 2018 by Greenlight Environmental Consultancy. A Habitat Suitability Index assessment was undertaken, and the ponds ranged from 'poor' to 'average' suitability for GCN. Ponds P3 and P7 were found to be dry and inaccessible respectively. The remaining ponds (P9-20) were considered ecologically separated from the site either by Pound Hill and residential development to the north or the railway line and extensive arable land to the east. Although a culvert was present beneath the railway line, the land in between the site and ponds to the east was dominated by arable or amenity land of limited value to GCN.

3.37 Further presence/absence further undertaken on ponds P1, P2, P4-P6 and P8 in 2018 identified a low population of GCN within P8. GCN were not identified within the other ponds surveyed. Pond 8 is located approximately 255m north-west of the site with optimal habitats in close proximity to the pond including woodland/hedgerows and allotments.

3.38 Given the limited suitable terrestrial habitat on site, the distance of a low population of GCN 250m from the site and the presence of more suitable habitat in closer proximity, it is considered highly unlikely that GCN in P8 are utilising the habitats on site. Therefore, the site is considered to have **site** importance for GCN and confidence in this assessment is high.

Reptiles

3.39 There were three records of reptiles identified within 2km of the site. These are summarised in Table 4.

Table 4: Records of reptile species within 2km of the site boundary

Reptile species	Number of records	Closest record (km)	Last recorded
Slow-worm	2	0.7 SW	2018
Grass snake	1	0.7 SW	2018

3.40 The site was of limited value to reptiles due to dominance of arable land with little opportunities for foraging or shelter. The peripheral grassland margins, hedgerows and brash piles (TN1) provided some suitable habitat for foraging, commuting, shelter/rest, and hibernation with adjacent basking opportunities however these were limited in area. The railway corridor adjacent the south-eastern boundaries provided connectivity into the wider landscape while the western hedgerow/tree line also provided connectivity. The northern part of the site was

bordered by residential dwelling while further arable land was present beyond the southern boundary reducing potential connectivity to the wider landscape.

3.41 Therefore, the site is valued at the **site** level for reptiles and confidence in this assessment is currently high.

Hazel Dormice

3.42 There were no records of dormice within 10km of the site. The site's hedgerows were predominantly defunct along the northern and eastern boundaries. The western boundary comprised an intact hedgerow connected to a small area of woodland to the south. The woodland was surrounded by a 'moat' with a sparse canopy and understory. In addition, it lacks connectivity to other areas of woodland and therefore highly unlikely to support hazel dormice.

3.43 Due to the lack of records and connective habitat, the site is considered to have **negligible** importance for dormice and confidence in this assessment is high, and as such is no longer considered in this report.

Invertebrates

3.44 There were a small number of invertebrate records returned from the records centre: the small heath *Coenonympha pamphilus* and white admiral *Limenitis camilla* butterflies, 13-spot ladybird *Hippodamia tridecimpunctata* and the nationally scarce wasp *Crossocerus distinguendus*.

3.45 The majority of the site comprised common and widespread habitat abundant in the local landscape. It is considered unlikely to support an important assemblage of invertebrates and therefore the site is considered of **site** importance for invertebrates and confidence in this assessment is high.

Other Notable Species

3.46 There were 45 records of hedgehog *Erinaceus europaeus* within 2km of the site.

3.47 The arable land has some potential to support brown hare while the perimeter habitats provide opportunities for hedgehog, harvest mouse and common toad. The site is considered to have **site** value for these species and confidence in this assessment is currently high.

Summary

Table 5: Summary evaluation of features

Feature	Summary description	Value	Confidence
SAC/SPA/Ramsar	None within 10km	National	High
SSSI	A single SSSI within 5km. Gipping Great Wood SSSI is located c. 4.4km south-east	National	High
CWS	There were two CWS within 2km	County	High
Habitats on site	Arable Hedgerows Ditches Scattered scrub Poor semi-improved and semi-improved grassland margins Scattered trees	Site	High
Badger	No signs of badger noted during surveys	Site	High
Bats	No roosting habitats present on site, and very limited foraging present on site boundaries.	Site	High
Birds	Habitats on site considered likely to support mostly common and widespread.	Site	High
Great crested newt	Low population located 250m of the site.	Site	High
Reptiles	Limited suitable foraging, basking and hibernating habitat in the form of hedgerows and grassland.	Site	High
Hazel dormice	Very limited suitable habitat for this species and lack of connectivity to other suitable habitats	Negligible	High
Invertebrates	Habitats on site preliminarily considered common and widespread and unlikely to support important invertebrate assemblage	Site	High
Other notable species	Grassland, and scrub habitat suitable for European hedgehog, common toad and harvest mouse.	Site	High

4.0 Preliminary prediction of impacts, recommendations and mitigation measures

Statutory/Non-statutory Sites

- 4.1 There were no sites of international importance within 10km of the proposed development and the site does not fall within the IRZ of any statutory sites. As such no impacts from the proposals are anticipated.
- 4.2 A single site of national importance was present within 5km of the application site. This was Gipping Great Wood SSSI 4.4km south-east. Given the distance, no direct impacts will occur as a result of the development. In addition, residential development is not considered a likely impact on the Natural England IRZ and the SSSI is considered at such a distance that no indirect impacts including recreational disturbance are anticipated.
- 4.3 There were two CWSs within 2km of the application site. Cow Green CWS is 1.2km south-east and there are no direct footpaths leading directly to the site from the proposed development. In addition, the site is a small area of species-rich grassland with no amenity infrastructure. As such it's considered highly unlikely that additional residents would seek out this site for amenity use. Topcroft Farm Meadows CWS is 1.1km north. A footpath leads north towards Westhorpe from Bacton village crossing through the CWS. Any additional footfall through the CWS will be concreated on the existing footpaths and given the distance and relatively small-scale development of up to 85 units it is considered unlikely to adversely impact the nature conservation value of the CWS.
- 4.4 Both construction and occupation impacts upon designated sites from the proposed development are considered **negligible**.

Habitats

- 4.5 Construction will lead to the loss of primarily low-value arable land and poor semi-improved grassland margins. The boundary hedgerows, ditches and trees, considered of greater ecological value, will largely be retained and enhanced.
- 4.6 In addition to the direct loss of habitats, the construction phase of the development has potential to impact retained habitats on site and adjacent the site (hedgerows) through incidental pollution events, damage of retained trees, hedgerows and their roots and indirect impacts through increased lighting levels are also possible. These impacts are considered potentially **adverse** at up to **site** level.
- 4.7 Potential occupation phase impacts include increased recreational pressure on retained habitats, and indirect impacts through increased lighting levels. These impacts are considered potentially **adverse** at up to **site** level.
- 4.8 The development proposal has sought to avoid and minimise impacts by retaining and buffering the most valuable habitat on site. All retained hedgerows and trees will be buffered by areas of open space. Hedgerows and trees should be protected from damage (e.g. through root compaction) during development through the erection of suitable fencing such as HERAS fencing in line with recommendations in the Arboricultural Impact Assessment (SES 2021).
- 4.9 Loss of habitat will be compensated for through the creation of new habitat including wildflower meadow around the site boundaries, the attenuation area in the west of the site, and planting of native hedgerows and

trees throughout the site. The landscaping plan is provided within Appendix 5 and an accompanying Landscape and Ecology Management Plan (LEMP) (Golby and Luck, 2021) details management specifications to provide benefits to wildlife and enhance the ecological value of the site.

- 4.10** Retained trees and hedgerows will be protected from potential indirect impacts of increased nocturnal lighting via the implementation of a wildlife-friendly lighting scheme throughout the development, which maintains 'dark zones' and avoids direct lighting of ecologically sensitive features such as tree canopies. The lighting scheme will be specifically designed to avoid light spill on any hedgerows, trees and edge habitats.
- 4.11** Enhancement measures will include the creation of new native hedgerows and tree belts along the northern, southern and eastern boundaries and throughout the development, additional native tree planting, sowing of wildflower/meadow mixes and maintenance of a tall sward in some landscaped areas (e.g. within the attenuation basin and hedgerow understoreys).
- 4.12** Recommended seed mixtures for enhancing habitats on site include: EP1 - Emorsgate Pond Edge Mixture is suitable for seeding around the attenuation basic where conditions are likely to remain damp for much of the year; EH1 – Hedgrow Mixture which included shade tolerant species suitable to hedgerow understory's and EM1 - General Purpose Meadow Mixture for areas in the west and north of the site proposed for a wildflower meadow with sensitive management. All management prescriptions are detailed within the accompanying LEMP.
- 4.13** During construction it is considered that habitat loss associated with site clearance will represent an **adverse** effect at the **site** level. Other potential construction impacts may be reduced to **negligible** through the measures advised.
- 4.14** Post-development, compensatory habitat and higher-value new habitats will be provided, addressing temporary habitat loss during construction. Through this and the implementation of the above additional measures, the residual effect on habitats is likely to be **neutral**.

Protected and notable species

Badgers

- 4.15** No signs of badger were noted during the update survey. Given the transient nature of this species there is a risk that construction may cause injury/death. To mitigate these impacts the following precautionary techniques that are sympathetic to badgers are 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;
 - Capping of any pipes overnight;
 - Storing chemicals securely overnight (e.g. locked away); and
 - A toolbox talk will be given to on-site operatives detailing these precautionary measures.
- 4.16** Inclusion of wildflower planting in the POS and with the addition of berry rich native species hedgerow planting on site will be beneficial for foraging badgers.
- 4.17** With the retention of existing boundaries, as well as the above precautionary working methods, it is predicted

that the development will result in a **neutral** residual effect on badgers.

Bats

- 4.18** No potential bat roosting habitat was identified within the site. Bat activity from predominantly common and widespread species was recorded during previous bat surveys (Greenlight Environmental Consultancy 2018) with activity concentrated along the western boundary. Low numbers of rare bats including barbastelle were also identified using the western boundary for commuting/foraging. There is potential for the bat assemblage currently utilising the site for foraging and commuting to be adversely affected through increases in artificial lighting and habitat loss during the construction and operational phases of the development. Impacts could disrupt dark corridors present along the site boundary habitats, potentially having an **adverse** effect at the **site** level by driving abandonment of foraging and commuting pathways.
- 4.19** The proposals will retain the western boundary hedgerow with an area of open space. All other boundary vegetation will be retained and enhanced in order to retain foraging and commuting habitat for bats. In addition, a new hedgerow/tree line will be planted along the southern boundary to improve connectivity across the site.
- 4.20** The indirect impact of artificial lighting requires mitigation to ensure the local bat population are protected from disturbance. A sensitive lighting scheme will be designed to avoid light spill onto hedgerows, trees and perimeter habitats which may be utilised for commuting/foraging/roosting bats.
- 4.21** Site lighting around key features likely to be used by roosting, foraging or commuting bats will be avoided during both the construction and occupation phases. Lighting along the site's boundary features or circular walk should be avoided. Where lighting is necessary, then there are a number of ways to minimise the effect of lighting on bats (and other nocturnal species such as badgers and owls). The following mitigation strategies have been taken from the Institution of Lighting Professionals and Bat Conservation Trust's Guidance Note 08/18 Bats and artificial lighting in the UK (2018) and other referenced sources:
- In general, light sources should not emit ultra-violet light 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).
 - Limiting the height of lighting columns to eight metres and increasing the spacing of lighting columns (Fure, 2006) can reduce spill of light into unwanted areas. Only luminaires with an upward light ratio of 0% and with good optical control should be used. Luminaires should always be mounted on the horizontal, i.e. no upward tilt.
 - Other ways to reduce light spill include the use of directional luminaires, shields, baffles and/or louvres. Flat, cut-off lanterns are best. Additionally, lights should be located away from reflective surfaces where the reflection of light will spill onto potential foraging/commuting corridors. Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill. Where windows and glass facades etc. cannot be avoided, low transmission glazing treatments may be a suitable option in achieving reduced illuminance targets.
 - Lighting that is required for security or access should use a lamp of no greater than 2000 lumens (150 Watts) and be PIR sensor activated on a short timer (1 minute), to ensure that the lights are only on

when required and turned off when not in use (Jones, 2000; Hundt, 2012). A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

- 4.22 In line with the previous Ecological Impact Assessment, a number of enhancement measures for roosting bats are proposed. These include 20 integrated bat boxes on new buildings (Schwegler 1FR Bat Tube, Figure 1, or similar). The location of proposed enhancement measures are detailed within the Biodiversity Enhancement Plan (Appendix 7).

Figure 1 :Schwegler 1FD bat box erected on a tree.



Figure 1: Schwegler 1FR Bat Tube.



- 4.23 With the implementation of the above measures, impacts during the construction phase are predicted to be **negligible**.
- 4.24 With the implementation of the above measures and the provision of improved foraging resources within retained and created habitats, it is predicted that the residual effects upon bat populations will be **beneficial** at the **site** level.

Birds

- 4.25 Impacts during construction consist of potential nest destruction and disturbance, which constitutes an offence under The Wildlife and Countryside Act 1981 (as amended). In addition, construction will lead to loss nesting and foraging habitats, including open arable land. These are considered **adverse** effects at the **site** level, given the limited habitats available for breeding.
- 4.26 It is possible that breeding birds will be affected post-development through increased recreational disturbance (e.g. disturbance from dogs and other domestic animals). This is predicted to have an **adverse** effect at the **site** level.
- 4.27 Nesting and foraging habitat loss will be minimised through the retention of the hedgerow and tree network surrounding the site. Hedgerows and trees will be protected from damage (e.g. through root compaction) during development through the erection of suitable fencing such as HERAS fencing.
- 4.28 Where existing scrub, tree and hedgerow habitats will be lost, this will be mitigated for through compensatory planting, to include a range of native species that will provide new foraging resources for berry-eating bird species as well as attract invertebrates for those species reliant on insects. New tree and hedgerow planting will

be in excess of losses to deliver a net gain in nesting habitat for the development. Additional habitats including SUDS, gardens and amenity grassland will also provide foraging opportunities for bird species.

- 4.29** To comply with current legislation and avoid nest destruction, vegetation clearance works affecting nesting habitat (including hedgerows, trees, scrub, tall grasses/ruderals and open arable) will be scheduled so that these do not occur during the bird breeding season (i.e. outside the period March-August inclusive). If this is not possible, a check will be carried out by a suitably qualified ecologist no more than 48 hours in advance of clearance works. If an active birds' nest is found within the proposed clearance zone, suitable avoidance measures will be installed, such as creating a buffer zone with barrier tape around the nest to ensure that the nest is not damaged or destroyed by the works. The nest will then be monitored until all chicks have fledged and a suitably experienced ecologist confirms the nest is now inactive and works can safely proceed.
- 4.30** Recreational impacts post-development will be mitigated for through measures outlined in the habitats section, i.e. retention and new planting of hedgerows and creation of dark corridors around sensitive habitats. In addition, retained and created habitats will be specifically managed to benefit wildlife (including nesting birds). Specific details will be provided in the LEMP and will include measures such as a biennial and rotational approach to hedge maintenance to maximise berry production, and timing maintenance to take place in late winter to ensure that berries are retained as a winter food resource.
- 4.31** In accordance with the previous report the following mitigation measures have been extracted from the Ecological Impact Assessment by Greenlight Environmental Consultancy (2018) and will be undertaken to minimise impacts to skylark. The skylark plots as below will be located in the neighboring field to the south of the site:
- “Four skylark plots to be created in arable fields adjacent the site (two plots per potential skylark territory lost). Skylark plots are undrilled patches within winter cereal fields and should meet the Entry Level Stewardship Scheme criteria:
- Located within fields ≥ 5 ha and of an open aspect. If bounded by tree lines or woodlands, the field should ≥ 10 ha.
 - Skylark plots should be spaced across the field at a density of two plots per ha. Plots are created by turning off the drill, during sowing, to leave an unsown area, which measures 3-8m wide/long (16-24m²).
 - Skylark plots should be sited ≥ 24 m away from field boundaries or telegraph poles and not connected to the tramlines.
 - After drilling, skylark plots may be managed in the same way as the remainder of the field (i.e. they can be sprayed, receive fertilizer applications, etc.), although mechanical weeding of the plots must be avoided between 1 April and harvest.
 - The plots may move around the farm with the normal arable rotation, but the total number of plots must be maintained.”
- 4.32** Guidelines (RSPB) for the creation of skylark plots can be found within Appendix 8 and the work schedule for managing these plots is set out in Appendix 7.
- 4.33** Additional enhancements will include the installation of the following bird boxes with their locations detailed within the accompanying Biodiversity Enhancement Plan (Appendix 5).

- 20 integrated swift boxes on new buildings (Schwegler Brick Nest Box Type 25, Figure 2, or similar);

- 10 integrated house sparrow terraces on new buildings on site (Schwegler 1SP House Sparrow Terrace, Figure 3, or similar); and
- 10 small bird boxes on trees on site (a mixture of Schwegler 1B or 2H Nest Box, or similar).

Figure 2: Schwegler Brick Nest Box



Figure 3: Schwegler 1SP House Sparrow Terrace



4.34 With the implementation of the above mitigation, the effect on breeding birds is predicted to be **negligible** during the construction phase and **beneficial** at the site level during the occupation phase.

Reptiles

4.35 The site has very few opportunities for reptiles with only the peripheral vegetation providing foraging, shelter and commuting opportunities. While reptiles are considered unlikely to be present there is a very low risk of the loss of the grassland margins could result in killing and / or injury to individuals, an offence under the *Wildlife and Countryside Act 1981*. This is predicted to have an **adverse** effect at the **site** level.

4.36 During the occupational phase there is a risk of disturbance during management of retained and created habitats, as well as increased predation of reptiles e.g. due to increases in the number of local pet cats, which may reduce their viability and thus constitutes an **adverse** effect at the **site** level.

4.37 To mitigate for the risk of killing and/or injury to reptiles during construction, grassland margins should be maintained to 10cm in height. If these are allowed to grow longer, a precautionary approach to vegetation clearance should be undertaken during construction. Any clearance of grassland should be undertaken under the supervision of an Ecological Clerk of Works (EcoW). A toolbox talk will also be given to site workers and reptile identification information will be displayed on site. A destructive search will involve a hand search of suitable habitat prior to removal including the dismantling brash piles (TN1) by hand outside of the hibernation period considered November to February. A two-stage cut of tall grasses will be made, where the first cut is made to a height of no less than 10cm and searched or a left for a 24 hour period before remaining vegetation is cleared to ground level, allowing time for any disturbed animals to move away from the area.

4.38 New hedgerow planting, creation of the attenuation basin and low-intensity management of grassland within the western and northern areas of POS will provide new suitable habitat within the site for these species. The retained hedgerows together with new hedgerow planting will provide connectivity to the wider environment.

4.39 Additional enhancements will include the creation of four hibernacula for reptiles and amphibians. These could include log piles and rubble/spoil heaps to provide resting/shelter and hibernation opportunities. An example

of the design is included within Appendix 9, and locations are recommended in the Biodiversity Enhancement Plan (Appendix 7) which includes a management plan for maintaining the hibernacula.

4.40 With the implementation of the above mitigation, the effect on reptiles is predicted to be **negligible** during the construction phase.

4.41 With the implementation of the above mitigation, the effect on reptiles is predicted to be **neutral** during the occupation phase.

Great Crested Newt

4.42 A low population was found <250m north-west of the site. GCN are most likely to occupy good quality terrestrial habitat within 250m of a breeding pond (English Nature, 2001). Pond 8, where GCN were identified has mature hedgerow/woodland and allotments in closer proximity than the site. In addition, habitat within the site is of limited value to this species. As such the presence of GCN on the site is considered highly unlikely.

4.43 Despite this, a precautionary approach is recommended to minimise impacts in the unlikely event that GCN are present within the site. These will follow the same procedure set out above for reptiles with grassland and any woody vegetation clearance undertaken under the supervision of an EcoW with habitats checked prior to removal. All woody vegetation should be removed between March and October/November outside of the GCN hibernation period.

4.44 Enhancements for this species are similar to those set out above for reptiles and include the provision of semi-natural habitats, connective habitat around the site's boundaries and the creation of four hibernacula (see Appendix 7)

4.45 With the implementation of the above measures, it is considered that construction and residual effects on GCN will be **beneficial**.

Invertebrates

4.46 Loss of habitat during the construction phase is likely to result in killing and/or injury to a common invertebrate assemblage only.

4.47 During the occupation phase, there is potential for indirect effects through increased light levels which could result in the abandonment of habitat. This is predicted to have an **adverse** effect at the **site** level.

4.48 Construction impacts to the existing invertebrate assemblage on site will be minimised through the retention and buffering of hedgerow and trees as previously discussed.

4.49 The development proposal contains areas of open space which may be utilised to create new invertebrate habitat areas within the site. The landscaping scheme will provide appropriate habitat and resources, such as:

- New structural planting of hedgerows to provide linear features which some invertebrates fly along, shelter from wind, and warm microclimates;
- Retention of deadwood generated through site clearance in the form of log-piles;
- Planting of new flower rich areas

- Artificial lighting will be kept to a minimum and designed to avoid lighting areas of semi-natural vegetation, with lighting columns of appropriate height, directional lighting and the use of baffles. Where possible wavelengths should include a minimal UV component, as previously discussed in the bat mitigation section above.

4.50 With the implementation of the above measures, it is considered that the residual effects on invertebrates will be **beneficial**.

Other Notable Species

4.51 Brown hare, harvest mouse, common toad, and hedgehog are listed as Species of Principal Importance under the NERC Act 2006. Should these species be using habitats on site, effects may include death / injury, habitat loss and fragmentation.

4.52 If present, brown hare is likely to be displaced from arable habitats into the wider landscape however given the size of the site, the number of animals present is likely to be low and displacement from the site is considered unlikely to have a significant effect on the local hare population.

4.53 Brown hare are unlikely to remain on site post-development therefore impacts during the occupation phase are applicable to hedgehog, common toad and harvest mice, which may utilise retained habitats and colonise new habitats created. Increased disturbance and predation by domestic animals, as well as increases in recreational disturbance, is possible during the occupation phase which is likely to have an **adverse** effect at the **site** level. Although gardens will provide suitable foraging habitat for hedgehog, if access is restricted hedgehogs (and other small mammals) are likely to become isolated through fragmentation.

4.54 The risk of construction impacts to hedgehog, harvest mouse, and common toad will be minimised through the retention and protection of hedgerows and associated ditches.

4.55 To facilitate the movement of hedgehogs through the site post-construction, ‘hedgehog highways’ will be provided within all new lengths of garden (and where feasible boundary). A 13cm x 13cm hole is recommended which is too small for most pets and can be delivered by raising a fence panel per garden, installing hedgehog friendly fencing, removing a brick at the bottom of a wall or cutting a hole in fencing/walls.

Figure 2: Hedgehog friendly fencing



4.56 Where clearance of suitable habitat is necessary, precautionary measures will be followed in line with measures proposed for reptiles/GCN. During the destructive search, any harvest mice nests and hedgehog will be looked for and a two stage cut of tall grasses made allowing time for any disturbed animals to move away from the area.

4.57 Recreational impacts during occupation will be mitigated through measures outlined in the habitats section, *i.e.*

retention and enhancement of hedgerows and other retained habitats; creation of dark corridors around sensitive habitats. In addition, retained and created habitats will be specifically managed to benefit wildlife.

4.58 The provision of SUDS and areas of tall grass will provide habitat for the above species. The green space and garden habitats will provide preferred habitats for foraging hedgehog. Given the findings of recent studies (Johnson, 2015) highlighting the decline of hedgehogs throughout the UK in recent years, the provision of access points into residential gardens is an important measure providing access to foraging resources. To facilitate the movement of hedgehogs through the site, it is recommended that one 13cm x 13cm hole should be provided within all new lengths of garden (and where feasible boundary) fencing to permit movement of hedgehogs through back gardens. This size gap is too small for most pets and can be undertaken by raising a fence panel per garden; installing hedgehog friendly fencing; removing a brick at the bottom of a wall or cutting a hole in fencing / walls.

4.59 With the implementation of the above measures, it is considered that construction and residual effects on other notable species will be **neutral**.

5.0 Conclusions

5.1 A summary of likely impacts and mitigation is provided in Table 7.

Table 6 :Summary impacts, mitigation and enhancement measures and residual effects.

Feature	Construction Impacts	Mitigation	Occupation Phase Impacts	Mitigation and Enhancement Measures	Residual effect
SPAs, SACs and Ramsar sites	None	N/A	None	N/A	Negligible (C & O)
SSSI	None	N/A	None	N/A	Negligible (C & O)
CWS	None	N/A	None	N/A	Negligible (C & O)
Habitats	Loss of arable land and grassland margins Damage to retained hedges and trees Pollution events	Protection of retained hedgerows, trees and adjacent woodland New tree and hedgerow planting. Grassland and SUDS creation. LEMP detailing how retained and created habitats will be sensitively managed for benefit of wildlife Sensitive lighting strategy	Recreational/lighting disturbance	Sensitive lighting strategy	Adverse (C) Neutral (O)
Badger	Accidental death and injury of foraging/commuting animals. Loss of foraging / commuting habitat.	Standard mitigation measures including: capping of pipes, pollution prevention and backfilling open trenches Creation of habitats suitable for badgers (new hedgerows, fruiting trees)	None	Provision of significant areas of open space	Negligible (C) Neutral (O)

Feature	Construction Impacts	Mitigation	Occupation Phase Impacts	Mitigation and Enhancement Measures	Residual effect
Bats	Construction lighting impacts	Sensitive lighting scheme Retention and buffering of hedgerows	Indirect impacts to roosting, foraging and commuting bats	Buffering of hedgerows Creation of species-rich grassland and attenuation basin with native seeding Sensitive lighting scheme Provision of bat boxes within the development	Negligible (C) Beneficial (O)
Breeding birds	Construction impacts on nests of breeding birds including destruction and disturbance	Appropriate pre-clearance checks if clearance required within breeding season (March to August inclusive) Retention and protection of hedgerows and trees Skylark plots offsite	Increased recreational disturbance	Retention and creation of habitats suitable for nesting birds with favourable management Provision of bird boxes within the development	Negligible (C) Beneficial (O)
Invertebrates	Loss of habitat resulting in killing and / or injury of common assemblage	Retention and protection of hedgerows and trees	Indirect effects through increased light levels	Sensitive lighting scheme Native-species planting within landscaped areas	Negligible (C) Beneficial (O)
Reptiles	Death / injury during clearance	Destructive search supervised by EcoW	Increased recreational disturbance and predation	Provision of reptile hibernacula, attenuation basin and long-grass habitats	Negligible (C) Neutral (O)
Great Crested Newts	Death / injury during clearance	Destructive search supervised by EcoW	Increased recreational disturbance and predation	Provision of reptile hibernacula, attenuation basin and long-grass habitats	Negligible (C) Beneficial (O)
Other notable species	Death injury during vegetation clearance of hedgehog, common toad, and harvest mouse. Displacement of brown hare	Retention and protection of hedgerows Sensitive vegetation clearance	Potential increased mortality from domestic pets Isolation from new gardens	Creation of areas of open space and 'hedgehog highways' to allow access to gardens	Negligible (C) Neutral (O)

5.2 Through the above recommendations, precautionary methods and following the Biodiversity Enhancement Plan, it is considered that all significant impacts upon biodiversity, including any potential adverse impacts upon specific protected species, habitats and designated sites will likely be able to be wholly mitigated in line with relevant wildlife legislation, *chapter 15 of the National Planning Policy Framework* (MHCLG, 2019).

6.0 References

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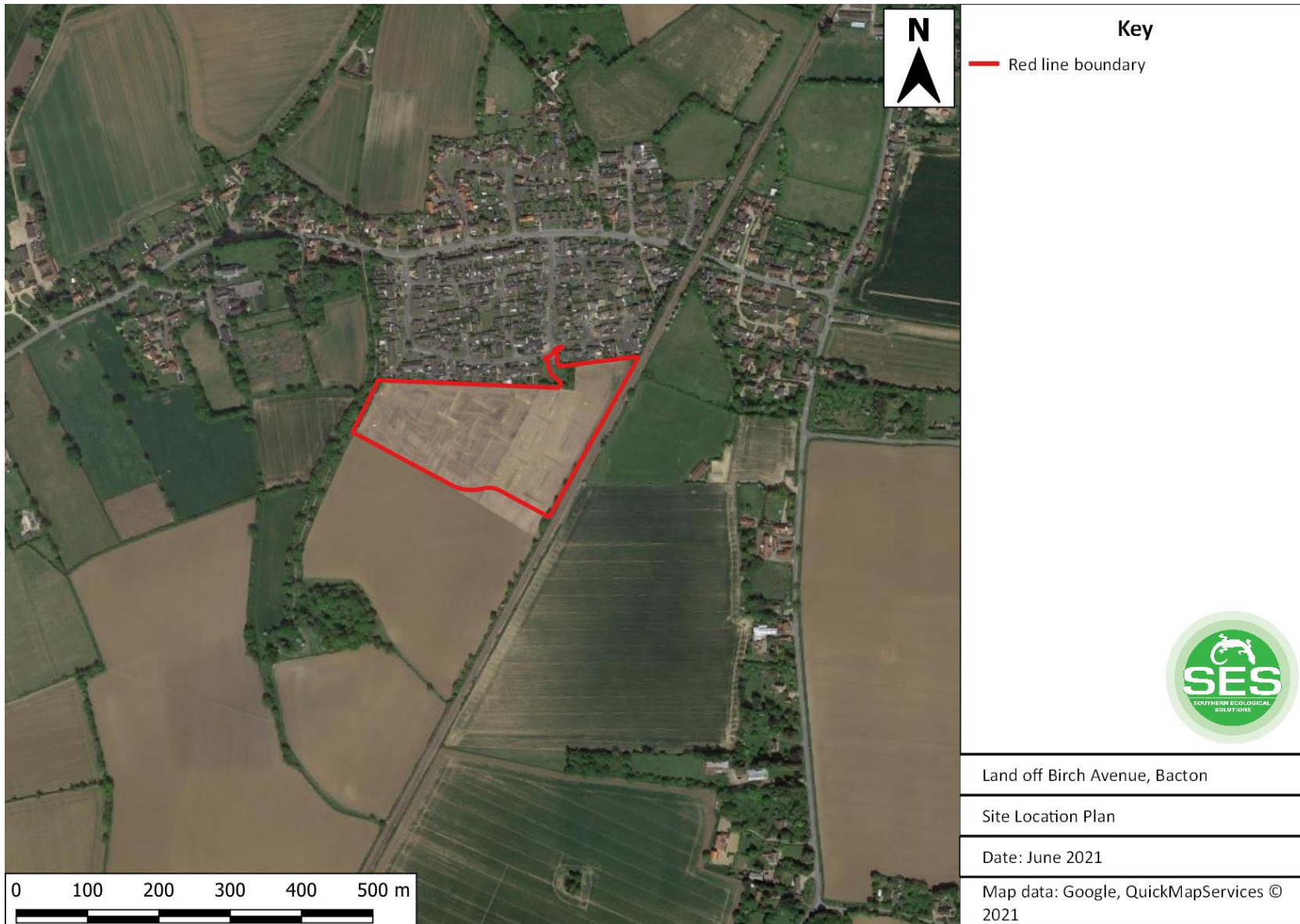
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Appendix 1. Site Location Plan



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, 2019) 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 stepping stones 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 taking into account 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 – Thurrock Local Development Framework (2015)

Policy SP09 – Enhancement and Management of the Environment

1) The Council will require development to support the enhancement and management of the natural and local environment and networks of green infrastructure, including: landscape; biodiversity, geodiversity and the historic environment and historic landscapes through detailed development management policies set out in the Plan, including environmental protection measures, such as biodiversity net gain and sustainable urban drainage systems. Cross-boundary mitigation of effects on Protected Habitats Sites

2) Development that creates new dwelling(s) within the identified Protected Habitats Sites Mitigation Zone will be required to make appropriate contributions through legal agreements towards management projects and/or monitoring of visitor pressure and urban effects on Habitats Sites and be compliant with the HRA Recreational disturbance and Avoidance Mitigation Strategy. Development will otherwise need to submit separate evidence of compliance with the Habitats Regulations Assessment regarding predicted impacts upon relevant designated sites.

3) All development proposals will be required to support and contribute to the Councils’ project to maintain, enhance and protect biodiversity net gain, the networks of habitats and green infrastructure.

Policy LP18 - Biodiversity & Geodiversity

1) All development should follow a hierarchy of seeking firstly to; enhance habitats, avoid impacts, mitigate against harmful impacts, or as a last resort compensate for losses that cannot be avoided or mitigated for. Adherence to the hierarchy should be demonstrated.

2) Development should:

- a) Protect designated and, where known, potentially designated sites. Proposed development which is likely to have an adverse impact upon designated and potential designated sites, or that will result in the loss or deterioration of irreplaceable biodiversity or geological features or habitats (such as ancient woodland and veteran/ancient trees) will not be supported.

- b) Protect and improve sites of geological value and in particular geological sites of international, national and local significance.
- c) Conserve, restore and contribute to the enhancement of biodiversity and geological conservation interests including priority habitats and species. Enhancement for biodiversity should be commensurate with the scale of development.
- d) Plan positively for the creation, protection, enhancement and management of local networks of biodiversity with wildlife corridors that connect areas. Where possible, link to existing green infrastructure networks and areas identified by local partnerships for habitat restoration or creation so that these ecological networks will be more resilient to current and future pressures.
- e) Identify and pursue opportunities for securing measurable net gains, equivalent of a minimum 10% increase, for biodiversity. Where biodiversity assets cannot be retained or enhanced on site, the Councils will support 'biodiversity offsetting' to deliver a net gain in biodiversity off-site in accordance with adopted protocols.
- f) Apply additional measures to assist with the recovery of species listed on S41 of the NERC Act 2006.

3) Development which would have an adverse impact on species protected by legislation, or subsequent legislation, will not be permitted unless there is no alternative and the local planning authority is satisfied that suitable measures have been taken to:

- a. Reduce disturbance to a minimum; and
- b. Maintain the population identified on site;
- c. Provide adequate alternative habitats to sustain at least the current levels of population.

4) Where appropriate, the local planning authority will use planning obligations and/or planning conditions to achieve appropriate mitigation and/or compensatory measures and to ensure that any potential harm is kept to a minimum.

England Priority Species and Priority Habitats

The [UK Post-2010 Biodiversity Framework](#), published in July 2012, has now succeeded the UK Biodiversity Action Plan. Much of the work previously carried out under the UK BAP is now focussed at a country level. England Priority Species and Priority Habitats are those that have been identified as being the most threatened and requiring conservation action under the England Biodiversity Strategy.

Badgers

Badgers have historically been given legal protection since 1973 however [the Protection of Badgers Act 1992](#) consolidated and strengthened previous legislation. It is a criminal offence to:

- Wilfully kill, injure, or take any Badger.
- Possess or cruelly ill-treat a badger.
- Possess any dead badger or part of one.
- Possess or control a living, healthy Badger.
- Intentionally or recklessly damage, destroy or obstruct access to a sett, or disturb a Badger whilst it is occupying a sett.

The maximum fine per offence is £5000; the [Countryside and Rights of Way Act 2000 \(CRoW\)](#) amendment contains a provision for a custodial sentence of up to 6 months instead of, or in addition to, a fine. Along with a lengthy development delay until an appropriate mitigation programme has been agreed and completed.

Local authority planning departments should also meet the requirements of the National Planning Policy Framework (NPPF) 2018; which requires planners not only to protect biodiversity, but where possible to enhance it. Planning authorities are required to take into account of protected species so an ecological survey is normally required.

Bats

All UK bat species are protected under European and UK law (Conservation of Species and Habitats Regulations (CHSR) 2017; Wildlife and Countryside Act (WCA) 1981). Some are also Natural Environment and Rural Communities (NERC) Act 2006 /UK Biodiversity Action Plan (UK BAP) priority species and local BAP species. Protected and NERC/UK BAP/local BAP species are a material consideration under the NPPF (MHCLG, 2019).

Hazel Dormice

Hazel dormice are protected under UK and European law primarily by the WCA (1981) as amended and regulation 41 of the CHSR (2017). Taken together it is illegal to:

- Deliberately kill, injure or capture any wild animal of European protected species;
- Deliberately disturb wild animals of any European protected species in such a way to be likely to significantly affect:
 - The ability of any significant groups of animals of that species to survive, breed, rear or nurture their young;
 - or
 - The local distribution of that species.
- Recklessly disturb a European protected species;
- Damage or destroy breeding sites or resting places of such animals;
- Deliberately take or destroy the pups of such an animal;
- Possess or transport any part of a European protected species, unless acquired legally; and
- Sell, barter or exchange any part of a European protected species.

Birds

All UK wild birds are afforded statutory protection under the WCA (1981) (below). In addition to this statutory protection British birds are also classified according to their conservation status, including their position on the Red and Amber lists of *Birds of Conservation Concern in the UK 3* (Eaton *et al*, 2009) and whether they have been identified as Priority Species under the England Biodiversity Strategy. All British birds are also covered by the EU Birds Directive.

EU Birds Directive

Under the EU Birds Directive all bird species naturally occurring on the European territory of the EU are protected. This means they must not be deliberately killed, caught or disturbed, and their mating, breeding, feeding and roosting habitats must not be destroyed. The taking and destruction of eggs is prohibited as well as keeping of wild-caught birds

A major provision of the Directive includes the identification and classification of Special Protection Areas (SPA's) for rare or vulnerable species which are listed in Annex I of the Directive. The Directive also regulates the hunting of certain species of birds listed in Annex II, while Annex III regulates the sale, transport, keeping and offering for sale of certain live or dead game birds. In the UK, the provisions of the 'Birds Directive' are implemented through the WCA (1981)

Wildlife and Countryside Act 1981.

Wild birds in the UK are protected under the WCA (1981). Under this legislation all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions, to intentionally kill, injure, or take any wild bird or their eggs or nests (exceptions to this are listed in Schedule 2). In addition, a select group of species are further listed under Schedule 1 of the Act and these have additional protection that makes it an offence to disturb these birds at the nest, or to disturb their dependent young.

Birds of Conservation Concern:

Red list species are those that are Globally Threatened according to IUCN criteria, those with populations or ranges that have declined rapidly in recent years and those that have declined historically and not shown a substantial recent recovery.

Amber list species are those with an unfavourable conservation status in Europe, those whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.

Green list species are all regularly occurring species that do not qualify under any of the Red or Amber criteria. The Green list also includes those species listed as recovering from Historical Decline in the last review that have continued to recover and do not qualify under any of the other criteria.

The Natural Environment and Rural Communities (NERC) Act 2006; Section 41

The Natural Environment and Rural Communities (NERC) Act came into force on 1 October 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England.

England Priority Species on the list (see below) are those species found in England which have been identified as requiring action under the England Biodiversity Strategy. The list is used to guide decision-makers such as public bodies, including local and regional authorities, to have regard to the conservation of biodiversity in England.

GCN

GCN are protected under S9 of the WCA (1981) and regulation 41 of CHSR (2017). Taken together offences relevant to this project are likely to be:

- Deliberately kill, injure or capture any wild animal of European protected species;
- Deliberately disturb wild animals of any European protected species in such a way to be likely to significantly affect:
 - The ability of any significant groups of animals of that species to survive, breed, rear or nurture their young; or
 - The local distribution of that species.
- Intentionally or recklessly disturb an animal while occupying a place used for shelter or protection;
- Damage or destroys breed sites or resting places of such animals;
- Deliberately takes or destroys the eggs of such an animal;
- Possess or transport any part of a European protected species, unless acquired legally.

Other Amphibians

Amphibians (common frog, common toad, smooth newt, palmate newt) are protected under Section 9(5) of the WCA (1981) against:

- Selling, offering or exposing for sale, or having in possession or transporting for the purpose of sale, any live or dead wild animal or any part of, or anything derived from, such an animal;
- Publishing or causing to be published any advertisement likely to be understood as conveying buying or selling, or intending to buy or sell, any of those things.

Invertebrates

Many invertebrates are listed as UK BAP priority species and as Species of Principal Importance (NERC S.41). Although such species do not receive protection under criminal law their presence is a material planning consideration, consequently (following Natural England, 2010):

- Regional Planning Bodies and Local Planning Authorities will use the Section 41 list to identify the species and habitats that should be afforded priority when applying the requirements of the NPPF (MHCLG, 2019) to promote the *“protection and recovery of priority species populations”*.
- Local Planning Authorities will use it to identify the species and habitats that require specific consideration in dealing with planning and development control, recognising that under NPPF the aim of planning decisions should be to avoid minimise impacts to biodiversity.

Of wider relevance to biodiversity assessment is the presence of other rare and scarce invertebrates, of which potentially there are several thousand in the United Kingdom. These species comprise the majority of invertebrate diversity and conservation value, and their significance is poorly defined within legislation and planning policy.

Reptiles

Habitats found on/off site are suitable for common lizards, slow-worms, grass snakes and adders which are protected under the WCA (1981). These species are listed on schedule 5 and offences are outlined under S9 (1) and S9 (5) and are follows:

- Intentionally, or recklessly, kill or injure any of the above species, and/or;
- Sell, or attempt to sell, any part of the species, alive or dead.

The maximum fine per offence is £5000 and if more than one animal is involved, the fine is £5000 per animal (WCA 1981, S21). The CRoW amendment contains a provision for a custodial sentence of up to six months instead of, or in addition to, a fine, along with a lengthy development delay until appropriate mitigation has been agreed and completed.

The NERC (2006) also lists the above reptiles as a species of ‘principle importance’ under S41 and s40 requires every public body in the exercising of its functions (in relation S41 species) *‘have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity’*

Small and medium-sized mammals

Species highlighted for further consideration within this report are European hedgehog, harvest mice, brown hare and polecat which are all listed as UK Biodiversity Action Plan (UK BAP) priority species, Essex priority (local BAP) species, and as species of principal importance (section 41) of the NERC Act 2006. Although such species do not receive protection under criminal law their presence is a material planning consideration. Consequently:

- Regional Planning Bodies and Local Planning Authorities will use the Section 41 list to identify the species and habitats that should be afforded priority when applying the requirements of the National Planning Policy Framework (NPPF) (MHCLG, 2019) to promote the *“protection and recovery of priority species populations”*.

Local Planning Authorities will use it to identify the species and habitats that require specific consideration in dealing with planning and development control, recognising that under NPPF the aim of planning decisions should be to minimise impacts to biodiversity

Hedgerows

Hedgerows assessed as important under the Wildlife and Landscape criteria of the Hedgerow Regulations 1997 require permission from the local planning authority before they can be removed in whole or in part.

Appendix 3: CIEEM EcIA Methods

Ecological features are evaluated and assessed with due consideration for the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (EcIA) (CIEEM, 2016; updated 2018). For clarity, the evaluation and assessment process adopted within this report is set out below.

Establishing potentially important ecological features

Potentially important ecological features of relevance to the development are determined in accordance with current CIEEM guidelines. **Error! Reference source not found.** below sets out a non-exhaustive list of ecological features that are typically considered, along with key examples:

Table A4.1. Examples of potentially important ecological features.

Potentially important ecological feature	Typical examples
Statutory designated sites	SSSIs, SACs, SPAs, Ramsar sites, LNRs, NNRS
Non-statutory designated sites	LWSs, CWSs
Protected species	European protected species (<i>e.g.</i> GCN, bats)
International, National or local priority habitats	S41 priority habitats and species; Annex I Habitats
Notable species or sub-species	Individual red-listed species
Notable or large population or assemblage of species	Diverse bird assemblage; exceptional numbers of common amphibians
Novel or locally distinct assemblage of species	Diverse non-native floral community on a brownfield site; populations of individual species showing distinct physical variation
Habitats which form diverse mosaics, create important connection and/or have synergistic attributes;	Brownfield habitat mosaics; riparian habitat corridors; hedgerow network utilised by an important bat population
Habitats of potential importance (with regard to restoring or creating habitats to S41 priority or SSSI quality)	Previous Ancient Woodland (PAWs) sites
Habitats of secondary or supportive importance (which safeguard important habitats, or which support important populations of species)	Scrub habitats buffering calcareous grassland from agricultural improvement; pasture regularly utilised by bird populations for which an SPA is designated

Establishing likely Zone of Influence (Zoi)

For the purposes of this assessment, the site is considered to be inside the 'zone of influence' of:

- Internationally important designations within 22km of the site boundary.
- Nationally important designations within 5km of the site boundary.
- Locally important designations within 2km of the site boundary.
- Non-statutory designations within 2km of the site boundary.

The arbitrary distances identified set out above considered sufficient for identifying the majority of designations which may be affected by the proposals. However, it is acknowledged that in certain circumstances effects beyond these distances are possible and should be considered as far as is reasonably practicable to do so.

It should also be noted that certain ecological features have smaller 'zones of influence' than those mentioned above. For such features the appropriate zone of influence is described and justified as appropriate within the report, depending on their respective sensitivity to an environmental change.

The results of professionally accredited or published scientific studies have been used and referenced, where available, to establish the spatial and temporal limits of the biophysical changes likely to be caused by specific activities and to justify decisions about the zone of influence.

Determining importance of ecological features

In determining the importance of ecological features, a range of guidelines and reference materials have been utilised, including:

- Criteria against which statutory and non-statutory nature conservation designations are selected (*e.g.* SSSI designation criteria; LWS selection criteria).
- Definitions for national and priority habitats.
- Publications and guidelines against which to establish the importance of particular populations or assemblages of species groups (*e.g.* Wray *et al* for evaluating bat populations and roosts; ISIS for assessing conservation interest of invertebrate assemblages).
- Publications describing the conservation status of individual species (*e.g.* Red-data books).
- The Hedgerows Regulations to assess the importance of hedgerows.
- National, regional and local species Atlases.
- Species/group population trends.

It should be noted that the legal protection which some species and their habitats receive are considered separately from 'importance' within this assessment as not all legally protected species are necessarily rare (*e.g.* common pipistrelle bat). Legal issues and the appropriate mechanism for dealing with any such constraint are addressed in the report.

It should also be noted that the social, community, economic or multifunctional importance attributed to ecological features are not assessed as they fall outside the scope of this assessment.

Geographic frame of reference

In assigning importance to an ecological resource the following geographic frames of reference are used:

- International;
- National (*i.e.* England);
- Regional (South East);
- County (Suffolk);
- District (Mid Suffolk);
- Local or Parish (Bacton); and
- Within Site or zone of influence only

The size, conservation status and the quality of features or species are all relevant in determining value. Furthermore, the value of a species and / or habitat may vary depending on its geographical location.

Characterising effects and any significant effects of the proposed project or occupation are characterised using the following terminology:

- Direct or indirect
- Beneficial or adverse
- Magnitude and/or extent
- Duration
- Reversibility
- Timing and frequency

Impacts have been assessed using the Mitigation Hierarchy, which forms the key principles of Ecological Impact Assessment (EclA):

- Avoidance – seeking options to avoid harm to ecological features;
- Mitigation – seeking options to avoid or minimise adverse effects;
- Compensation – offsetting adverse effects through appropriate compensatory measures;
- Enhancements – seeking to provide net benefits for biodiversity.

Determining ecologically significant effects

An ecologically significant effect is defined as an effect (adverse or beneficial) on the integrity of a defined designated site or ecosystem and/or the conservation status of habitats or species within a given geographical area.

The importance of any feature that will be significantly affected is then used to identify the geographical scale at which the impact is significant. This value relates directly to the consequences, in terms of legislation, policy and/or development control at the appropriate level. So, a significant adverse effect on a feature's importance at one level would be likely to trigger related planning policies and, if permissible at all, generate the need for development control mechanisms, such as planning conditions or legal obligations, as described in those policies.

If an effect is found not to be significant at the level at which the resource or feature has been valued, it may be significant at a more local level. Significant effects on features of ecological importance will be mitigated (or compensated for) in accordance with guidance derived from policies applied at the scale relevant to the value of the feature or resource. The scale is derived from the interaction of the feature sensitivity and magnitude of impact.

Appendix 4. Phase 1 Habitat Map



Appendix 5. Landscaping Plan



Plant Schedule

Item	Species	Supply	Size	Qty	Notes
101	Redwood	100	100cm x 100cm	10	
102	Redwood	100	100cm x 100cm	10	
103	Redwood	100	100cm x 100cm	10	
104	Redwood	100	100cm x 100cm	10	
105	Redwood	100	100cm x 100cm	10	
106	Redwood	100	100cm x 100cm	10	
107	Redwood	100	100cm x 100cm	10	
108	Redwood	100	100cm x 100cm	10	
109	Redwood	100	100cm x 100cm	10	
110	Redwood	100	100cm x 100cm	10	

Specimen Shrub

Item	Species	Qty	Notes
111	Redwood	10	
112	Redwood	10	
113	Redwood	10	
114	Redwood	10	
115	Redwood	10	

Commoned Indigenous

Item	Species	Qty	Notes
116	Redwood	10	
117	Redwood	10	
118	Redwood	10	
119	Redwood	10	
120	Redwood	10	

Shrub

Item	Species	Qty	Notes
121	Redwood	10	
122	Redwood	10	
123	Redwood	10	
124	Redwood	10	
125	Redwood	10	

Native Air Hydroponic

Item	Species	Qty	Notes
126	Redwood	10	
127	Redwood	10	
128	Redwood	10	
129	Redwood	10	
130	Redwood	10	

Integrated Anemone

Item	Species	Qty	Notes
131	Redwood	10	
132	Redwood	10	
133	Redwood	10	
134	Redwood	10	
135	Redwood	10	

Amenity Shrub

Item	Species	Qty	Notes
136	Redwood	10	
137	Redwood	10	
138	Redwood	10	
139	Redwood	10	
140	Redwood	10	

go by+luck

Appendix 6. Pond Location Plan



Appendix 7. Biodiversity Enhancement Plan

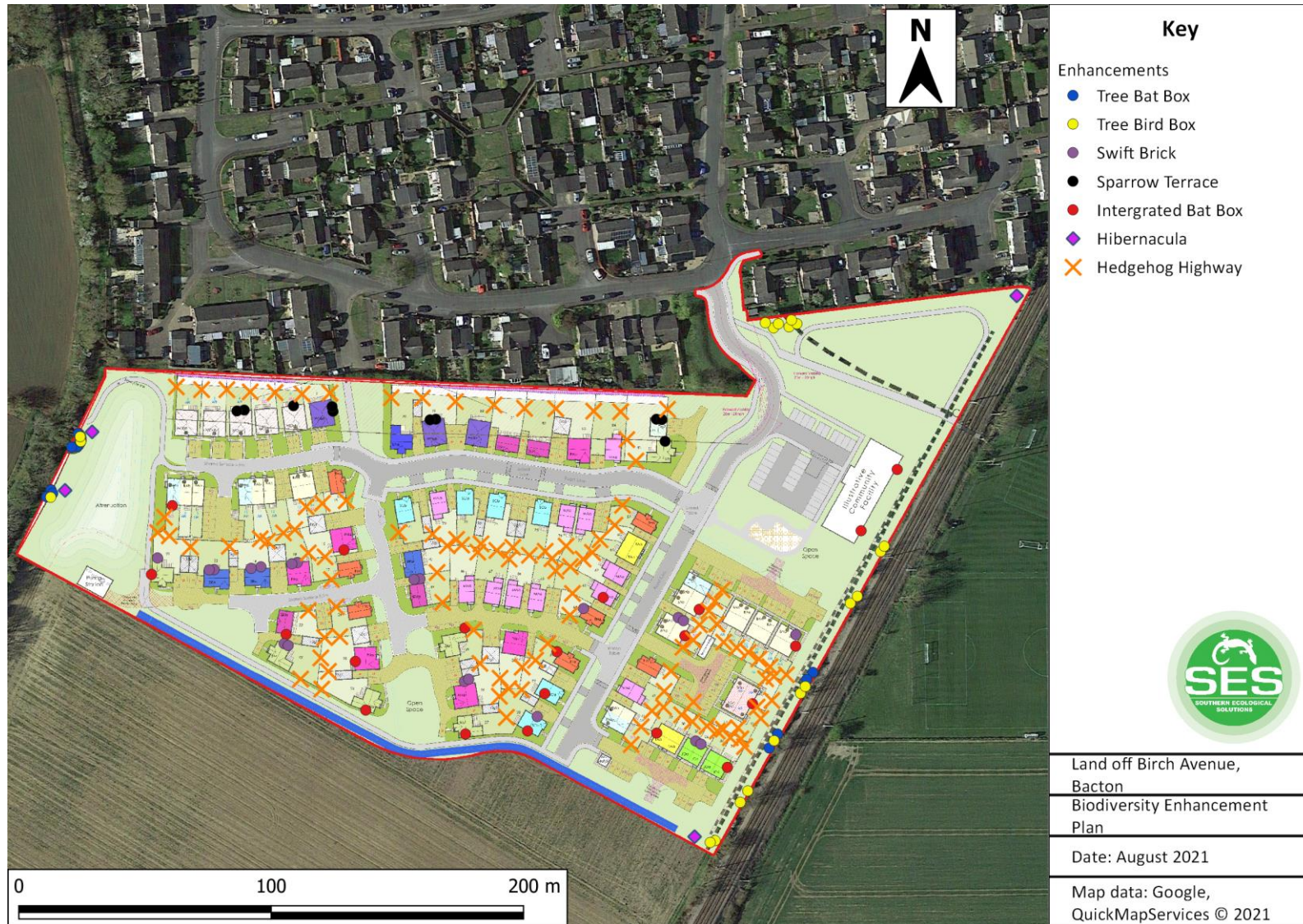


Table A7.7: Work Schedule

Feature	Management Prescriptions	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr9	Yr 10
Reptiles/Invertebrates	Creation of log and brash pile along east and west boundaries	✓									
	Replenishment with material from site management		✓	✓	✓	✓	✓	✓	✓	✓	✓
Birds	Erection of bird boxes	✓									
	Clearing out of boxes in winter		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Creation of four 16-24m ² skylark plots as per section 4.31 prior to clearance of site	✓									
	Annual creation of skylark plots to ensure a minimum of four plots at any one time (2 p/ha) at least 50m from boundaries as per section 4.31 (September to February)		✓	✓	✓	✓	✓	✓	✓	✓	✓
Bats	Erection of bat boxes (prior to occupation)	✓									
Hedgehog	Creation of 'hedgehog highways' in fences (prior to occupation)	✓									

Responsible Persons and Work Programme

1. The overall responsibility for implementing this Biodiversity Enhancement Plan will be by the principal contractor or third party that is suitably qualified to undertake the works.
2. A biodiversity champion will be nominated by the main contractor which will be the onsite initial point of contact for wildlife related matters. An ecologist will liaise with the biodiversity champion to ensure this BEP is implemented correctly.
3. The work programme above outlines the recommended creation and management prescriptions with timings provided. The work programme should be reviewed every five years or sooner if necessary.



for birds
for people
for ever

FARMING FOR WILDLIFE

Skylark plots



Andy Hay / rspb-images.com

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 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

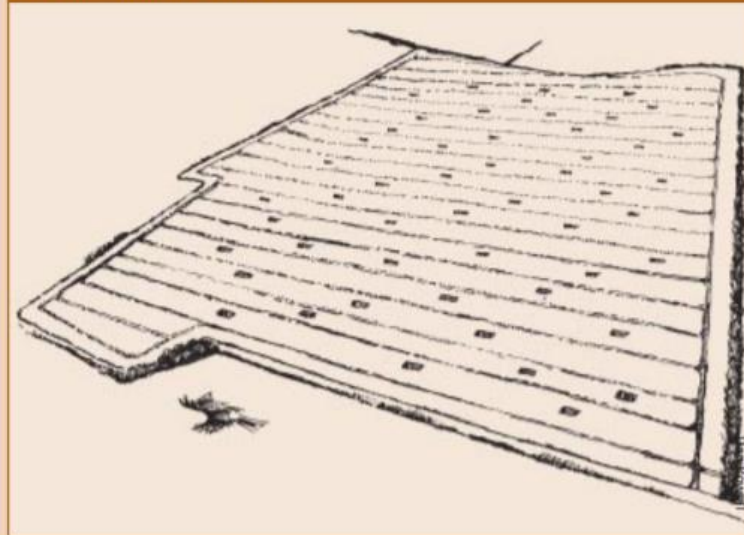
Drill width (m)	Plot length (m)
3	6 to 8
4	4 to 6
6	3 to 4
8	3

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



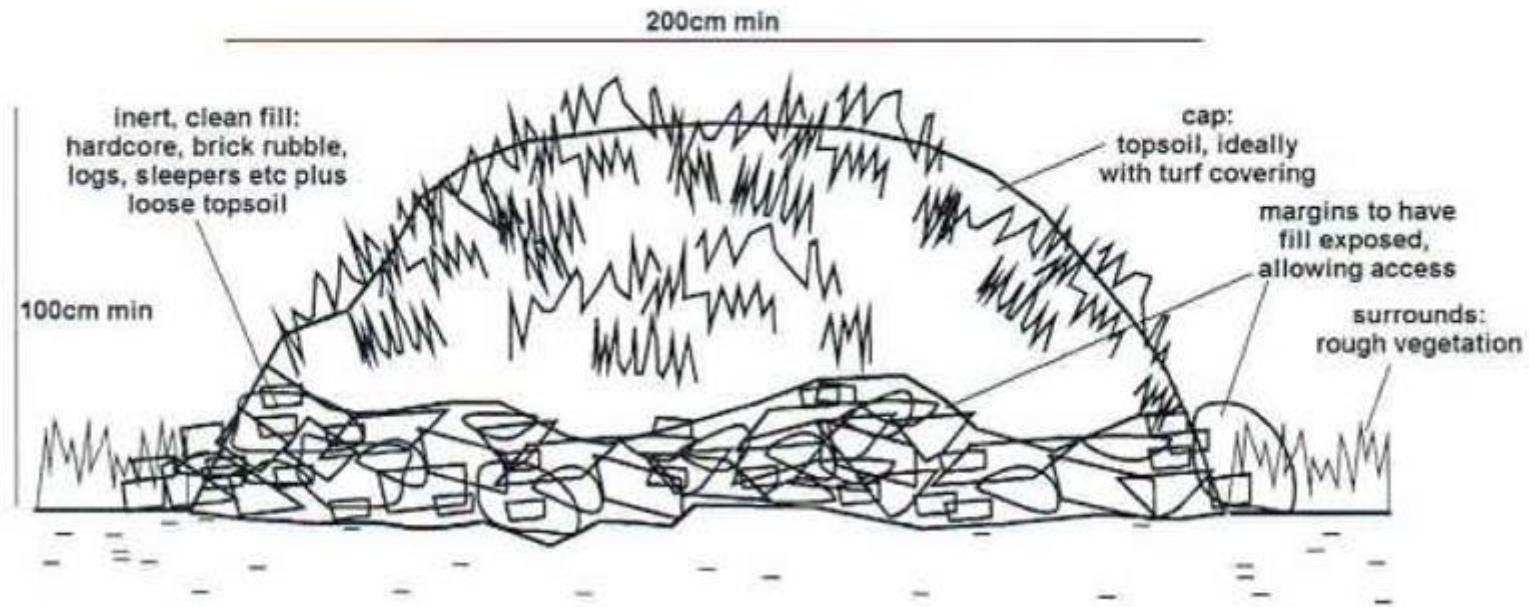
223-0989-04-05

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.

Appendix 9. Hibernacula Design

Figure 3: Suggested hibernaculum design

This design mimics artificial and natural conditions in which great crested newts have frequently been found overwintering. Dimensions should not be below 2m length x 1m width x 1m height. The illustrated design would be suitable for locating on an impermeable substrate. On free-draining substrates, the design is largely similar but the bulk of the fill is sited in an excavated depression in the ground. Hibernacula should ideally be positioned across a site, both close to and distant from breeding ponds, always in suitable terrestrial habitat and above the flood-line.



Source: English Nature (2001) *Great Crested Newt Mitigation Guidelines*, Peterborough.

Appendix 10. Plant Species List and Relative Abundance

Common name	Latin name	Arable	Scrub	PSI grassland in north of site	PSI grassland margins
Annual meadow-grass	<i>Poa annua</i>	O		F	
Blackthorn	<i>Prunus spinosa</i>		F		
Bramble	<i>Rubus fruticosus agg.</i>				O
Broad leaved dock	<i>Rumex obtusifolius</i>	R			
Bristly ox-tongue	<i>Helminthotheca echioides</i>	O			
Cleavers		O			F
Cocks foot	<i>Dactylis glomerata</i>	R			A
Common field speedwell	<i>Veronica persica</i>	R			
Common mallow	<i>Malva sylvestris</i>			R	
Common mouse-ear	<i>Cerastium fontanum</i>			O	
Common nettle	<i>Urtica dioica</i>	O			F
Common ragwort	<i>Senecio jacobaea</i>	R			
Cow parsley				LF	F
Creeping buttercup	<i>Ranunculus repens</i>			F	
Daisy	<i>Bellis perennis</i>			F	
Dandelion	<i>Taraxacum officinalis</i>	R		O	
Dove's-foot crane's-bill	<i>Geranium molle</i>	R		R	
Elder			O		
False oat-grass	<i>Arrhenatherum elatius</i>				F
Field maple	<i>Acer campestre</i>		F		
Ground ivy					O
Meadow foxtail	<i>Alopecurus pratensis</i>	R			
Perennial rye grass	<i>Lolium perenne</i>			A	
Red dead-nettle	<i>Lamium purpureum</i>	R			
Red fescue	<i>Festuca rubra</i>			F	
Ribwort plantain	<i>Plantago lanceolata</i>			O	
Round-leaved fluellen	<i>Kickxia spuria</i>	R			
Sharp-leaved fluellen	<i>Kickxia elatine</i>	R			
Shepherd's purse	<i>Capsella bursa-pastoris</i>	R			
Spear thistle	<i>Cirsium vulgare</i>	R			
White clover	<i>Trifolium repens</i>			F	
White dead-nettle	<i>Lamium album</i>	R			
Willowherb sp	<i>Epilobium sp</i>	O			
Yarrow	<i>Achillea millefolium</i>				O

D=Dominant; A=Abundant; F=Frequent; O=Frequent; R=Rare

Appendix 11. Site Photos

Plate 1: Grassland margin and beech hedge along northern boundary



Plate 2: Grassland margins along railway



Plate 3: Poor semi-improved grassland in POS



Plate 4: Ash trees in north of site



Plate 5: Log pile along northern boundary



Plate 6: Hedgerow along western boundary

