



Ecological Impact Assessment

Land South of A259 Angmering,



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Contents

1.0 INTRODUCTION	4
PURPOSE OF THE REPORT	4
SITE CONTEXT AND PROPOSALS	4
LEGISLATION	6
PLANNING POLICY	7
2.0 METHODOLOGY	8
ECOLOGICAL ASSESSMENT METHODOLOGY	11
3.0 BASELINE ECOLOGICAL CONDITIONS	15
<i>Biological Records from SxBRC</i>	15
<i>Designated sites</i>	18
<i>Habitats</i>	19
<i>Species and species groups</i>	22
<i>Bats</i>	22
<i>Badgers</i>	23
<i>Breeding birds</i>	23
<i>Great Crested Newts</i>	24
<i>Hazel Dormice</i>	24
<i>Reptiles</i>	24
4.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT	25
5.0 ASSESSMENT OF EFFECTS AND MITIGATION MEASURES	26
6.0 CUMULATIVE EFFECTS	29
7.0 COMPENSATION	30
8.0 ENHANCEMENT	30
9.0 MONITORING	31
10.0 SUMMARY AND CONCLUSIONS	31
11.0 REFERENCES	35
APPENDIX A: THE ECOLOGY PARTNERSHIP PRELIMINARY ECOLOGICAL APPRAISAL 2020	37
APPENDIX B: THE ECOLOGY PARTNERSHIP REPTILE SURVEY (2020)	38
APPENDIX C: DEVELOPMENT PROPOSALS	39

LIABILITIES:

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living creatures are capable of migration and whilst protected species may not have been located during the survey duration, their presence may be found on a site at a later date.

The views and opinions contained within this document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to or during works.

1.0 Introduction

Purpose of the Report

1.1 This Ecological Impact Assessment (EcIA) evaluates the effects of the development on land south of A259, Angmering. The findings of The Ecology Partnership's surveys are assessed against the proposals in order to:

- Evaluate the baseline interest;
- Identify and rank significant impacts;
- Set out mitigation and compensation measures and the means to secure these;
- Assess the significance of residual impacts;
- Identify enhancement measures; and
- Set out requirements for post-construction monitoring.

Site Context and Proposals

1.2 The site is situated on the eastern edge of the village of East Preston in West Sussex, approximately 4 miles west of the town of Worthing (TQ 08100 03089 – site centre point). The site is approximately 5.7ha in size.

1.3 The aerial photograph overleaf (Figure 1) shows the site and its immediate surroundings. The red line depicts the approximate site boundary and survey area.



Pro January 2021 (imagery date 23/04/2020).

- 1.4 Current proposals involve the construction of 76 units, a LEAP / LAP a community orchard and reedbeds.

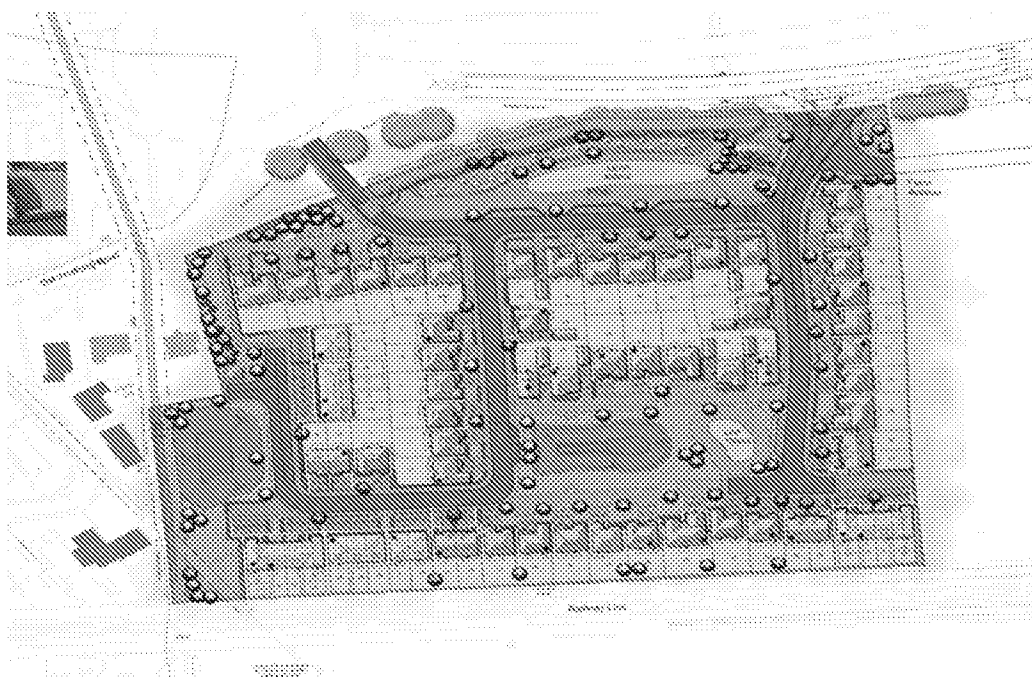


Figure 2: Current illustrative proposals for the site (June 2021).

Legislation

- 1.5 The following legislation has been considered in determining the scope of this EcIA.

Wildlife and Countryside Act 1981 (as amended)

- 1.6 The PEA identified the potential presence within the project's red line of several species or species groups listed on Schedule 5 of the Act, for which the provisions of Section 9 apply, necessitating surveys and assessments to determine presence/absence, location of activity and in some cases estimates of abundance, from which mitigation measures could, if necessary, be devised to comply with the Act. These species and species groups were bats, reptiles, great crested newt (*Triturus cristatus*) and hazel dormouse (*Muscardinus avellanarius*).
- 1.7 The PEA also noted habitat suitable for a number of breeding bird species, hence the need to assess the likely distribution of active nests, to provide constraints on site clearance in compliance with the protection provided to wild birds, their nests and eggs through Section 1 of the Act.

Natural Environment and Rural Communities Act 2006

- 1.8 Section 41 (Biodiversity lists and action (England)) of the Act requires the Secretary of State to “publish a list of living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity (in England)” and to “take such step as... reasonably practical to further the conservation... or promote the taking by others of such steps” for these (Section 41 List) species and habitats.
- 1.9 The PEA identified the presence of the Section 41 hedgerows as well as the potential presence of a number of Section 41 species, including the aforementioned bats, breeding birds, reptiles, great crested newts and hazel dormice as well as a number of bird species. Surveys and assessments for the species provided information to inform mitigation that could be requested by the local planning authority in relation to Section 41, in addition to meeting legislative requirements.

Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019

- 1.10 The Conservation of Habitats and Species Amendment protects biodiversity through the conservation of natural habitats and species of wild fauna and flora. It outlines the rules for the protection, management and exploitation of such habitats and species.
- 1.11 European Protected Species (EPS) are protected under this legislation includes all UK bat species, hazel dormice and great crested newt. If the development is likely to cause an offence against an EPS which significantly impacts their favourable conservation status; an EPS mitigation licence would be required to permit certain activities that would otherwise be illegal.
- 1.12 Special Area of Conservation (SAC) are designated for protecting one or more special habitats and/ or species, which includes sites such as Chicheser and Langstone Harbour SPA Ramsar SSSI and Solent Maritime SAC which are within 5km of the site. Special Protection Areas (SPAs) are selected to protect one or more rare, threatened or vulnerable bird species listed within this legislation. Development proposals which are likely to have a significant (adverse) effect on the National Site Network in the UK (including Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) is required to undertaken an Appropriate Assessment.

Planning Policy

- 1.13 The following national and local planning policies have been considered in determining the scope of this EcIA.

National Planning Policy

- 1.14 National policy guidance is provided by the **National Planning Policy Framework** (NPPF 2019), which sets out the Government's planning policies for England and how they should be applied. Section 15 of the document is entitled 'Conserving and Enhancing the Natural Environment'. This outlines the need for planning policies and decisions to contribute and enhance the natural environment, to minimise impacts from development and to provide net gains in biodiversity.

Local Planning Policy

1.15 The site falls under the planning control the Arun District Council Local Plan Part 2011-2031. These policies included the following which are considered relevant to Ecology, Biodiversity and Nature Conservation:

- Policy ENV SP1: Natural Environment
- Policy ENV DM1: Designated Sites of biodiversity or geological importance
- Policy ENV DM2: Pagham Harbour
- Policy ENV DM4: Biodiversity Opportunity Areas
- Policy ENV DM4: Protection of trees
- Policy ENV DM5: Development and biodiversity

2.0 Methodology

Scope of the Assessment

2.1 The zone of influence of the development is defined as:

- The project red line, for effects on designations, habitats and species;
- Adjacent habitat, considered by species, for mobile species with territories or foraging ranges that may overlap the site;
- Designated sites which can be impacted through development activities; and
- Undesignated priority (Section 41) habitats that may be sensitive receptors to increased recreational pressure or other impacts such as surface water pollution.

2.2 The types of features considered in the assessment of effects, to meet legislative and policy requirements, are:

- Designated sites (European, national and local);
- Protected species;
- Habitats and species of principal importance (Section 41 list);
- Hedgerows and woodland, where not of principal importance;
- Invasive species (Schedule 9 of Wildlife and Countryside Act); and
- Habitats, where not of principal importance, that may function as wildlife corridors or stepping stones.

Desktop Study

- 2.3 A desktop study was completed using an internet-based mapping service (www.magic.gov.uk) for statutory designated sites and an internet-based aerial mapping service (maps.google.co.uk) to understand the habitats present in and around the survey area as well as habitat linkages and features within the wider landscape. Records for the site and local area (up to 2km) were purchased from the Sussex Biological Records Centre (SxBRC) in 2020.

Field Surveys

Extended Phase 1 Survey

- 2.4 The Ecology Partnership undertook an extended preliminary ecological appraisal was undertaken on 6th August 2020 by ecologists Jade Brennan BSc (Hons) MSc ACIEEM and Joel Cronin BSc (Hons) MSc QCIEEM.
- 2.5 The surveyors identified the habitats present, following the standard 'Phase 1 habitat survey' auditing method developed by the Joint Nature Conservancy Council (JNCC). The Ecology Partnership surveyed the site on foot and the existing habitats, land uses and dominant plant species in each habitat were recorded on an appropriately scaled map (JNCC 2010).
- 2.6 The site was inspected for indications of the presence of protected species as follows:
- Evidence of badger, including setts, runs, snuffle holes and hairs;
 - The presence of features within trees such as fissures, holes, loose bark and/or ivy which had the potential for roosting bats;
 - Scrub/grassland mosaic and potential hibernation sites for common reptiles;
 - Relevant habitat for dormice, such as dense deciduous woodland and coppice;
 - The presence of suitable breeding places (waterbodies) and hibernation features for GCNs; and
 - Suitable nesting habitat for birds.

Protected Species Surveys

- 2.7 The desktop study and Phase 1 survey the potential to support roosting, foraging & commuting bats, breeding birds, reptiles, great crested newts (GCN) and dormice on site. Further surveys were recommended and undertaken within the red line boundary which is summarised in Table 1 below. Detailed survey methodologies are provided in the appended reports.

Table 1: Species surveys undertaken in 2020

Faunal Group	Survey Methodology	Date of Surveys	Guidance
Bats – Tree Inspection and commuting habitat	As part of the PEA, any trees supporting particular features likely to be of value to bats, such as splits, cracks, rot holes, coverings of ivy, peeling bark or similar, were recorded.	Trees were assessed on 6 th August 2020.	Bat Surveys – Good Practice Guidelines 3 rd edition (Collins 2016).
Badgers	A search for badger evidence was carried out during the site walkover, with particular attention paid to areas where the vegetation and/or the topography offered suitable sett sites such as embankments and wooded areas.	The site was initially assessed on 6 th August 2020	National Survey of Badgers (Creswell <i>et al.</i> 1990).
Breeding Bird Surveys	Site was assessed for its breeding bird potential.	The site was initially assessed on 6 th August 2020	British Trust for Ornithology Breeding Bird Atlas (Balmer <i>et al.</i> 2013).
Great Crested Newts (GCN)	The site was assessed on 6 th August Drains were located on the land separated by the A259	The site was initially assessed on 6 th August 2020	Great Crested Newt Conservation Handbook (Langton <i>et al.</i> 2001); Biggs <i>et al.</i> (2014).
Hazel dormice	Habitats assessed at the PEA.	The site was initially assessed on 6 th August 2020	Dormouse Conservation Handbook - 2 nd edition (Bright <i>et al.</i> 2006)
Reptiles	Habitats assessed during the PEA. Reptile survey established 15 th September 2020.	Surveys; 22/09/2020 24/09/2020 28/09/2020 30/09/2020 01/10/2020 06/10/2020 09/10/2020	Herpetofauna Workers Manual (Gent and Gibson 1998).

Ecological Assessment Methodology

- 2.8 This assessment has been carried out with reference to 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (CIEEM 2018).

Baseline condition

- 2.9 The baseline condition of the site is the situation documented in this report (section 3) from data (field surveys and desk study) gathered over 2020, plus any relevant modifications within or outside the red line within the zones of influence subsequent to the completion of the 2020 assessment and submission of the outline planning application.

Important ecological features

- 2.10 Important ecological features are those for which the decision maker (LPA or other regulator) needs the EcIA to help to assess the effects (negative, neutral or positive) and to guide the determination of the planning application. Important features are therefore generally defined by whether legislation or policy requires their consideration. For example, a European site within the zone of influence of the development is important and needs an assessment of effects. Similarly, at different levels, any legally protected species and any features such as wildlife corridors and section 41 species, with national or local policy support, are important features. Features that cannot be referenced to legislation and policy are generally not important and the next step of the EcIA (impact assessment) is not necessary. There may occasionally be situations where professional judgement and local expertise is relevant in defining local rarity as important, regardless of a lack of current legislative and planning support.
- 2.11 The CIEEM guidelines (2018) avoid rigid guidance on the levels of importance, which is often required within EIA, along with the level of magnitude of an effect, as one axis of an impact matrix. Sometimes a label of European, national or local importance may be obvious, for European sites, SSSIs and Local Wildlife Sites respectively. It is often less clear whether a small population of a Section 41 priority species or small extent of a Section 41 habitat should be of local or greater or less importance, as this may depend on data that does not exist on the distribution and abundance of the feature. Legally protected species

can be important solely because of the need to meet legislation, or because they are also a feature of a County Wildlife Site or target of a local Biodiversity Action Plan. In these cases, the same species could warrant different levels of importance, possibly with different implications for what is reasonable mitigation or compensation, beyond legislative compliance.

- 2.12 This report follows CIEEM guidelines (2018) in not forcing features into a level of importance, but using ranked importance where possible. Sites are given three levels, corresponding to their legislative and planning support: European, National and Local. Habitats and species, where not a qualifying feature of the hierarchy of sites, are simply referenced to the planning policy or legislation that supports their importance and where possible assessed from the extent, range or population size within zone of influence in relation to the extent, range or population size in the relevant administrative unit, for example LPA boundary or BAP boundary.

Impact assessment

- 2.13 According to CIEEM guidelines (2018), the only essential purpose of impact assessment in EcIA is: *“to assess and report significant residual effects that remain after mitigation measures have been taken into account. However, it is good practice for the EcIA to make clear both the potential significant effects without mitigation and the residual significant effects following mitigation”*.
- 2.14 Impact assessment is required for each feature determined as important and not for other features. CIEEM guidelines (2018) advise that each impact assessment should consider, if possible, the different stages of a development (construction, operation and decommissioning) and that it should be characterised by the following:
- Positive or negative - whether the impact leads to an adverse, beneficial or neutral effect;
 - Extent – the spatial area over which the impact occurs;
 - Magnitude – change in, for example, the amount of habitat or the size of population;
 - Duration – both in relation to the life cycle of the ecological feature and of the life of the project;

- Frequency and timing – for example, the number of disturbance incidents to birds and their timing in relation to the breeding cycle; and
- Reversibility – if and at what timescale recovery is possible.

2.15 As with the assessment of importance, CIEEM guidelines (2018) do not encourage a classification of the magnitude of impacts on a scale of severity. Rather, the significance of each impact should be assessed as the quantity of a feature of importance impacted; for example, residual loss of 5% of the extent of woodland within a Local Wildlife Site or gain of 10% in the extent of a section 41 habitat (hedgerows) on the site.

Avoidance, mitigation, compensation and enhancement

2.16 CIEEM guidance (2018) recommends a mitigation hierarchy. Once important features and significant impacts are identified, the project design should be modified where possible to avoid significant impacts. If avoidance is not possible, mitigation then compensation should be sequentially considered. A residual impact is an impact that remains after mitigation but is documented here both before and after compensation, as mitigation, particularly if embedded in the design, is assumed to be delivered without input from the LPA or other regulator, whilst compensation may require planning conditions and have some uncertainty on which the regulator should deliberate. Enhancement is an activity that results in a net gain in biodiversity, generally for an important feature, “over and above” anything required for mitigation or compensation. The terms mitigation and compensation are not always clearly defined and there is difference of opinion on their definitions. This report follows the Information Paper on the subject developed in consultation with Natural England for HS2 (2017), from which this quote and illustration are taken:

“A clear distinction is made between the use of the terms ‘mitigation’ and ‘compensation’ reflecting the habitual use in ecological impact assessment of ‘mitigation’ to mean ‘measures taken to avoid or reduce negative impacts’, as separate from ‘compensation’ meaning ‘measures taken to make up for the loss of, or permanent damage to, biological resources through the provision of replacement areas”

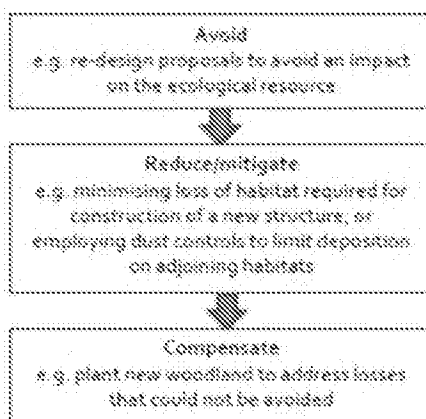


Figure 3: The mitigation hierarchy (from HS2 2017)

Limitations of the Assessment

- 2.17 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no single investigation could ensure the complete characterisation and prediction of the natural environment. The site was visited over the period of several site visits, as such seasonal variations cannot be fully observed and potentially only a selection of all species that potentially occur within the site have been recorded. Therefore, the survey provides a general assessment of potential nature conservation value of the site and does not include a definitive plant species list. However, the survey area was visited on a number of occasions over the optimal period, ensuring that detailed habitat information could be gathered. It is therefore considered that the survey work has allowed a robust assessment of habitats and botanical interest across the site.
- 2.18 The specific protected species surveys were undertaken at the appropriate time of year and during suitable weather conditions to an appropriate level of survey effort. Any specific limitations are noted in the relevant sections above or discussed in the results section.

3.0 Baseline Ecological Conditions

Biological Records from SxBRC

3.1 A 2km radius data search was requested from the Sussex Biodiversity Record in 2020. Notable protected species from this search are outlined below (Table 2). Only records from within the last ten years and those closest to site have been included.

Table 2: Biological Records from Sussex Biodiversity Record Centre within 2km of the site from the past 10 years

Species	Status	Distance from site	Most recent record
Stag Beetle <i>Lucanus cervus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; Habitats Directive Annex 2; NERC Act (2006) Section 41; Bern Convention Appendix 3	Approximately 180m SW of the site	2019
Chalk Hill Blue <i>Polyommatus coridon</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41	Within 2km of the site	2015
Brown Hairstreak <i>Thecla betulae</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41	Within 2km of the site	2019
Great Crested Newt <i>Triturus cristatus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; Bern Convention Appendix 2; European Protected Species; Habitats Directive Annex 2 & 4; NERC Act (2006) Section 41	Approximately 1.5km SE of the site	2013
Slow Worm <i>Anguis fragilis</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41; Bern Convention Appendix 3	Approximately 770m NW of the site	2017
Western European Hedgehog <i>Erinaceus europaeus</i>	NERC Act (2006); Bern Convention Appendix 3	Approximately 250m W of the site	2019
European Water Vole <i>Arvicola amphibius</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41	Approximately 750m SE of the site	2019
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2017
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4;	Within 2km of the site	2011

	Wildlife and Countryside Act (1981 as amended) Schedule 5		
Brown Long-eared <i>Plecotus Auritus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2011
Noctule Bat <i>Nyctalus noctula</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2011
Serotine Bat <i>Eptesicus serotinus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2011
Barbastelle <i>Barbastella barbastellus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2015
Grey Partridge <i>Perdix perdix</i>	NERC Act (2006) Section 41; Birds Directive Annex 2.1; Red List BoCC	Within 2km of the site	2015
Red Kite <i>Milvus milvus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; Convention on Migratory Species Appendix 2	Within 2km of the site	2020
Hen Harrier <i>Circus cyaneus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; Convention on Migratory Species Appendix 2; NERC Act (2006) Section 41	Within 2km of the site	2012
Peregrine <i>Falco peregrinus</i>	Wildlife and Countryside Act (1981 as amended); Birds Directive Annex 1; Bern Convention Appendix 2	Within 2km of the site	2018
Hobby <i>Falco subbuteo</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Bern Convention Appendix 2	Within 2km of the site	2018
Merlin <i>Falco columbarius</i>	Wildlife and Countryside Act (1981 as amended); Birds Directive Annex 1; Red List BoCC	Within 2km of the site	2012
Ringed Plover <i>Charadrius hiaticula</i>	BoCC Red List	Within 2km of the site	2018

Whimbrel <i>Numenius phaeopus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; BoCC Red List	Within 2km of the site	2018
Curlew <i>Numenius arquata</i>	Birds Directive Annex 2.2; Convention on Migratory Species Appendix 2; NERC Act (2006) Section 41	Within 2km of the site	2012
Woodcock <i>Scolopax rusticola</i>	NERC Act (2006) Section 41; BoCC Red List	Within 2km of the site	2018
Lapwing <i>Vanellus vanellus</i>	Birds Directive Annex 2.2; Convention on Migratory Species Appendix 2; NERC Act (2006) Section 41	Within 2km of the site	2018
Black-tailed Godwit <i>Limosa limosa</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; BoCC Red List	Within 2km of the site	2018
Green Sandpiper <i>Tringa ochropus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km of the site	2013
Turtle Dove <i>Streptopelia turtur</i>	Birds Directive Annex 2.2; NERC Act (2006) Section 41	Within 2km of the site	2014
Cuckoo <i>Cuculus canorus</i>	NERC Act (2006) Section 41; BoCC Red List	Within 2km of the site	2011
Hoopoe <i>Upupa epops</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km of the site	2015
Grasshopper Warbler <i>Locustella naevia</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2014
Wood Warbler <i>Phylloscopus sibilatrix</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2014
Woodlark <i>Lullula arborea</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; NERC Act (2006) Section 41	Within 2km of the site	2010
Skylark <i>Alauda arvensis</i>	NERC Act (2006) Section 41; Birds Directive Annex 2.2	Within 2km of the site	2019
Tree Pipit <i>Anthus trivialis</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2016
Yellow Wagtail <i>Motacilla flava</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Grey Wagtail <i>Motacilla cinerea</i>	Red List BoCC	Within 2km of the site	2018
Black Redstart <i>Phoenicurus ochruros</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Bern Convention Appendix 2; Red List BoCC	Within 2km of the site	2014
Whinchat <i>Saxicola rubetra</i>	Red List BoCC	Within 2km of the site	2018
Ring Ouzel <i>Turdus torquatus</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2017

Fieldfare <i>Turdus pilaris</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Birds Directive Annex 2.2; Red List BoCC	Within 2km of the site	2018
Song Thrush <i>Turdus philomelos</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2020
Redwing <i>Turdus iliacus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Birds Directive Annex 2.2; Red List BoCC	Within 2km of the site	2018
Mistle Thrush <i>Turdus viscivorus</i>	Red List BoCC	Within 2km of the site	2017
Spotted flycatcher <i>Muscicapa striata</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Pied Flycatcher <i>Ficedula hypoleuca</i>	Red List BoCC	Within 2km of the site	2013
Firecrest <i>Regulus ignicapillus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km of the site	2016
Starling <i>Sturnus vulgaris</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
House Sparrow <i>Passer domesticus</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Lesser Redpoll <i>Acanthis cabaret</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2015
Linnet <i>Linaria cannabina</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Brambling <i>Fringilla montifringilla</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km of the site	2010
Hawfinch <i>Coccothraustes coccothraustes</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Yellowhammer <i>Emberiza citronella</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Reed Bunting <i>Emberiza schoeniclus</i>	Wildlife and Countryside Act (1981 as amended); Amber List BoCC; UK BAP	Within 2km of the site	2018

**Additional species are present within the biological records but may be older than 10 years or outside our search radius. Some species have not been included due to the likelihood of presence on site due to habitat types.*

Designated sites

- 3.2 There are no international designations (e.g. SPAs, SACs) within 10km of the site, with Arun Valley SAC SPA, Ramsar and SSSI located over 11km north of the site. There are no other SSSIs located within 10km of the site.

- 3.3 There are three Local Wildlife Sites (LWS) within 2km of the redline boundary.

Table 3: Internationally designated sites within 10km of the site

Name of site and designation	Description (Taken from site citation where applicable)	Approximate Distance from Site (At nearest point)
Ferring Rife and Meadows (LWS)	This site consists of 1.3km of rife, plus several hectares of rough grassland. Situated adjacent to the urban area of Ferring it is of great local importance. It supports a nationally rare snail, <i>Monacha cartusiana</i> and a large proportion of a locally uncommon plant, Parsley Water-dropwort <i>Oenanthe lachenalii</i> . A good diversity of birds, butterflies and dragonflies have also been recorded.	Approximately c. 500m south east of the site
Highdown Hill and Miller's Tomb (LWS)	The Miller's Tomb SNCI, identified in 1992, comprises a small area of species-rich chalk grassland. The SNCI was extended in 1997 to include Highdown Hill. The whole site comprises relatively unimproved chalk grassland and scrub on the south facing scarp of a small outlier of the South Downs near Worthing.	Approximately c. 1.6km north east of the site
Goring and Ferring Gap (LWS)	Goring Gap was afforded protection from development through its designation as a 'Strategic Gap'. The site is important for birds with 106 species recorded over the last ten years, which represents over 25% of the total number of species ever recorded in Sussex. It is particularly important for wintering and passage birds, with the fields in the south west corner of the site regularly providing an important roost site for gulls and waders. Parts of the site are accessible for the public to enjoy nature and a local volunteer group is actively involved in managing the woodland in the east of the site	Approximately c. 1.8km south east of the site

Habitats

Context and surrounding priority (Section 41 list) habitats

- 3.4 The site is located to the east of East Preston. There is a network of priority habitats within 2km of the survey site boundary as shown in Figure 4 below. Deciduous woodland and ancient woodland lies within the wider landscape.
- 3.5 Less extensive priority habitats, not mapped in Figure 4, are within the surrounding landscape. There were no ponds identified within 250m of the redline boundary.

3.6 The surrounding landscape is mainly dominated by residential development and agricultural fields and is on the eastern edge of the village of East Preston. However, there are a number of priority habitats within 2km of the site (Figure 2):

- Approximately 450m from the site were traditional orchards
- Approximately 980m from the site was deciduous woodland
- Approximately 1.1km from the site was coastal and floodplain grazing marsh
- Approximately 1.2km from the site was lowland calcareous grassland
- Approximately 1.2km from the site was lowland fens
- Approximately 1.5km from the site was coastal vegetated shingle
- Approximately 1.7km from the site was ancient and semi-natural woodland

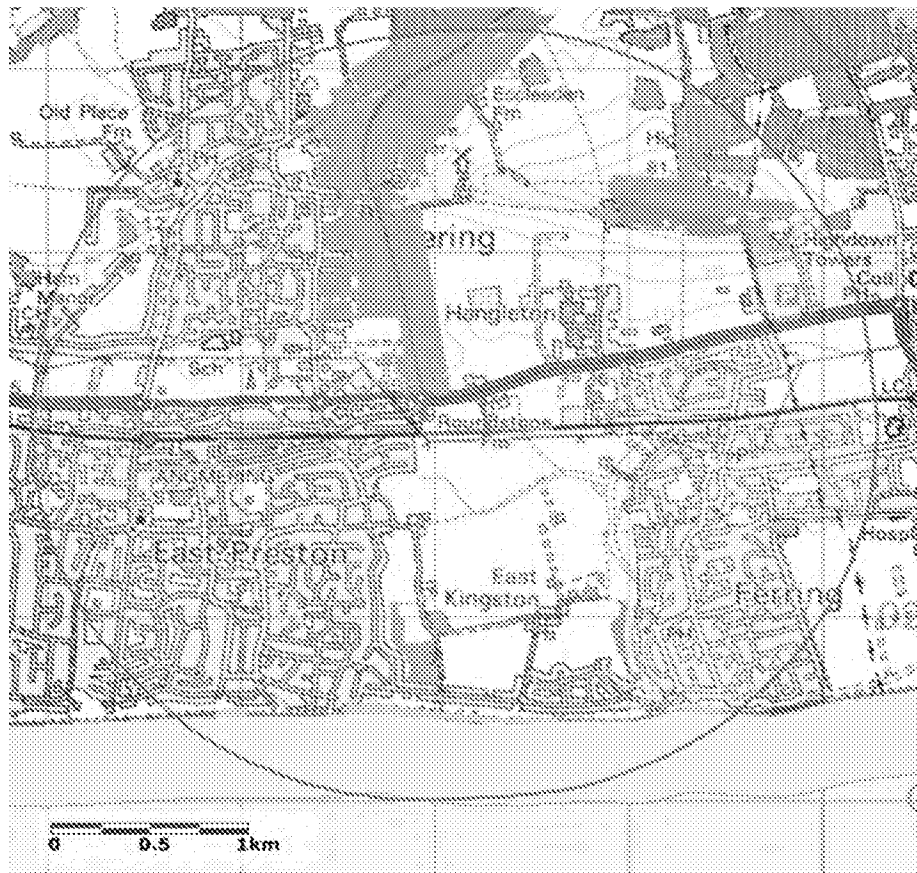


Figure 2: Priority habitats found within the wider landscape in relation to the site (site boundary shown in red with 2km buffer surrounding). Deciduous woodland is shown in dark green, ancient & semi-natural woodland with vertical brown hatching, lowland calcareous grassland in olive green, vegetated shingle in turquoise and coastal and floodplain grazing marsh in blue

Baseline habitats on the site

- 3.7 The site consisted of an arable field and associated uncultivated margins. The northern site boundaries supported tree lines. The southern site boundary bordered a railway and the western site boundary backed onto residential properties. The eastern site boundary borders open fields currently under management.
- 3.8 The dominant habitat on site was arable, the crop at the time of the survey had been harvested.
- 3.9 The field margins consisted of grassland, which appeared to be modified, with a high proportion of perennial ryegrass. At the time of the survey these areas had a high sward height and supported a variety of different species, including: perennial ryegrass, false oat grass and Yorkshire fog. Other species present bristly ox tongue, wall barley, burdock, fat hen, scented mayweed, bindweed, couch grass, common nettle, soft brome, common mallow, oilseed rape, hogweed, ivy, bramble, hedge mustard, mugwort, petty spurge, dandelion, groundsel, creeping thistle, knotgrass, broad leaved dock, pendulous sedge, black bryony, woody nightshade, Oxford ragwort.
- 3.10 Growing along the southern site boundary was a strip of scrub that extended onto the railway embankment past the site boundary. Species present included: bramble, common nettle, elder, buddleia, goat willow.
- 3.11 Along the northern edge of the site and western edge of the site were lines of trees. Tree species present along the northern site boundary included: Leyland cypress, Austrian pine, blackthorn, prunus sp., hawthorn. Tree species present along the western site boundary included poplar.
- 3.12 From the north west corner of the site to the east boundary was a hardstanding accessway. This area supported no plants.

Table 4: Summary table of habitat groups surveyed and present on the site and levels of importance

Habitat	Description	Level of Importance
Modified grassland	This habitat was found on the edges of the arable habitat. The grasslands was species-poor, with abundant perennial rye-grass in addition to false oat grass and Yorkshire fog Within the 'biodiversity net gain' (BNG) calculator would be considered 'modified grassland' and in 'poor' condition.	Site
Arable	The dominant habitat on site. Within the 'biodiversity net gain' (BNG) calculator would be considered 'arable' and in 'N/A agricultural' condition.	Site
Scrub	Small amounts of scrub habitat are present on the southern edge. Within the 'biodiversity net gain' (BNG) calculator would be considered 'mixed scrub and in 'poor' condition.	Site
Buildings and hardstanding	The access road Within the 'biodiversity net gain' (BNG) calculator would be considered 'urban-developed land' and would not be considered of value. .	N/A
Tree lines	A tree line is present along the northern section of the site Within the 'biodiversity net gain' (BNG) calculator would be considered 'tree line and in 'moderate' condition.	Local

Species and species groups

- 3.13 Species data is derived primarily from biological records within 2km of the site and the protected species surveys in 2020 commissioned to support this EcIA.

Bats

- 3.14 No buildings were present on site. The tree line along the northern site boundary supported a number of trees with “low” roosting bat potential and some were also covered with ivy. Trees were assigned roosting potential on the basis of their maturity and size in addition to any observed features typically associated with roosting bats.
- 3.15 The habitat surrounding the site was largely comprised of residential development and arable land. The site has limited connectivity across the landscape as the A259 runs along the northern boundary and a railway runs along the southern boundary. The site was

considered to be largely unsuitable for bats due to the suboptimal habitats. The tree line was considered to have some suitability, albeit the trees were located along the main road.

- 3.16 No further bat surveys were recommended as long as the tree line was retained. Local records provided included common and soprano pipistrelle, brown long eared bat, noctule and serotine. Barbastelle were also recorded within 2km.
- 3.17 **Soprano pipistrelles** (*P. pygmaeus*) and **Common pipistrelle** (*Pipistrellus pipistrellus*) are species are common and widespread bat species within the UK (Mathews *et al.* 2018). According to the Sussex Bat Group (2019), common pipistrelles are widespread and abundant in the county whilst soprano pipistrelles are widespread and fairly common.
- 3.18 **Noctules** (*Nyctalus noctula*) and **serotines** (*Eptesicus serotinus*) are considered to be uncommon and widespread in Sussex.
- 3.19 **Brown long-eared** (*Plecotus auritus*) are relatively abundant and widespread, in Sussex and in England, their population size is estimated to be 934,000 (Mathews *et al.*, 2018).
- 3.20 **Barbastelle** (*Barbastelle barbastellus*) is rare but widespread across much of south England, however, no reliable population estimate is available owing to a lack of data (Mathews *et al.* 2018). In Sussex, it is very rare but widespread with colonies known to be present in the Mens and Ebernoe Common SACs. The site is located outside the Sussex Bat SAC wider conservation zone.

Badgers

- 3.21 There has been no evidence of badger (*Meles meles*) activity on or directly adjacent to the site. The boundary habitats on site could provide suitable foraging and commuting opportunities for badgers. This species is protected for animal welfare reasons rather than their conservation status. As such, they are included to demonstrate legal compliance. Full results can be found within Appendix A (PEA, The Ecology Partnership, 2020a).

Breeding birds

- 3.28 The site is considered to be suitable for common and widespread birds associated with the habitat edges.

Great Crested Newts

- 3.29 There are recent biological records for great crested newt (GCN) (*Triturus cristatus*) within wider area. There were no ponds on site, or within 250m of the redline boundary. Considering the lack of on site suitable habitats and lack of records, it is considered highly unlikely that GCNs are present on site.

Hazel Dormice

- 3.30 There are no recent records for dormouse (*Muscardinus avellanarius*).

Reptiles

- 3.31 The site supported slow worms and common lizards which were identified on the margins of the fields. Across the field, the peak counts of adult reptiles were of 2 slow worms and 2 common lizards, and as such the population of both were considered to be 'low'.

Other Species

- 3.32 Species such as hedgehogs could be present on site and there are records in the local area.
- 3.33 The habitats on site were not considered to be suitable for water voles or otters due to lacking in their habitat requirements, and there are no recent records for otter within 2km of the site. Water voles are known to be present in the local area, however, there were no ditch networks on site or adjacent to the site.
- 3.34 There are recorded for stag beetle within the immediate surrounds. However, the site does not support dead wood and no suitable habitat in the form of brash piles or log piles.

Table 5: Summary table of faunal groups surveyed and present on the site and levels of importance

Faunal Group/Species	Description	Level of Importance
Bats (roosting)	A number of trees with potential for roosting bats were identified along the site boundary. These are to be retained within the scheme.	Site (legislative implications)
Bats (foraging and commuting)	The habitats on site are considered to have limited potential to support foraging bats. The northern edge had some, albeit limited suitability for foraging bats. At least 6 bat species were identified within the desk top study.	Site (poor quality foraging habitat in local context)

Faunal Group/Species	Description	Level of Importance
Badgers	There was no evidence of badger activity on site but the site does provide suitable foraging and commuting opportunities. This species has been included for legal compliance.	Site (legislative implications)
GCN	There are no ponds on site. There are no ponds within 250m of the redline boundary	N/A
Dormice	No suitable habitat present. Potential for species ruled out.	N/A
Reptiles	Low numbers of common lizard and slow worm were located on the edges of the site.	Site
Breeding birds	Common and widespread species only.	Site (legislative implications)

Future Baseline

3.35 Future baseline conditions are conditions which would be likely to arise if present conditions continue and a change of land use through the planning system does not occur. If the site remains as an arable field, then it is assumed that habitats will be continued to be managed for crops.

4.0 Description of the Proposed Development

4.1 The sketch site layout (Appendix C) shows the extent of the development area and green infrastructure area within the development area. A range of embedded mitigation and proposed compensation measures will be implemented within both the development and ownership boundaries.

4.2 Specified features of the submitted landscape and ecology strategy drawing that can be considered as **embedded mitigation** are:

- Creation of SUDS reed beds within the south western edge of the site;
- Trees with potential for roosting bats to be retained and buffered from development;
- Public open space provision within the masterplan for localised recreation.

4.3 Specified features of the submitted landscape and ecology strategy drawing that are proposed as **compensation** are:

- A sensitive lighting scheme across the site;
- Creation of new habitats, such as orchard, scrub and grassland.

5.0 Assessment of Effects and Mitigation Measures

5.1 The impact assessment is for the development as described above (Section 4), including the submitted site layout plan, landscape and ecology strategy and their embedded mitigation. This assessment does not separate construction and operation impacts, rather it is focussed on assessing effects on important features that would result from the final layout. Residual impacts are those that remain after mitigation and before compensation, which is considered in section 7.

5.2 Features within or overlapping the red line that require an impact assessment are those determined as important in section 3, namely:

- Tree line (northern aspect);
- Reptiles;
- Bats;
- Badgers;
- Breeding birds.

5.3 Important features offsite, but within the zone of influence of the development and have the potential to be impacted by increased recreational pressure, are:

- Ferring Rife and Meadows LWS;
- Highdon Hill and Miller's Tomb LWS;
- Goring and Ferring Gap LWS.

Local Wildlife Sites

5.4 Ferring Rife and Meadows is located approximately 500m south east of the site. The majority of this LWS is the rife itself and would not be subject to recreational disturbance. However, the rough grassland associated with the site and on either side of the rife are subject to recreational usage. Highdown Hill and Millers Tomb LWS is a well-used walking / recreation area. Goring and Ferring Gap is also used for recreation and a local group manage aspects of the woodland on the eastern edge.

5.5 There is no direct connectivity from the development area to any of the LWS as such any increases in dog-walking or recreational pressure on a daily basis would likely be

nugatory above the baseline. Therefore, it is anticipated that the development will have **no residual effect** on these sites.

- 5.6 There are no water courses on site and therefore there is no direct connectivity from the development area and Ferring Rife. However, there is a ditch network to the south of the railway line. The use of SUDs, , will also ensure that the off site ditch network is protected from any pollution events. Ensuring the use of mitigation measures means there will be **no residual effects**.

The Tree Line

- 5.18 The tree line along the northern aspect is considered to be of local value. This is due to the maturity of the trees and the provision of some landscape links, albeit this is limited. This tree line will be retained and buffered from the development. Ensuring the use of mitigation measures means there will be **no residual effects**.

Bats - foraging and commuting

- 5.21 The site lies outside the Sussex Bat SAC wider conservation zone (12km) and as such impacts outside this area are not considered to impact any of the Sussex Bat SACs.
- 5.22 There will be no significant loss of foraging habitat, with the works primarily impacting the arable land with is sub-optimal for these species. Foraging habitat along the northern edge, the tree line, will be retained. Pockets of scrub and modified grassland habitats will be lost, albeit this is not significant.
- 5.23 The extent of habitat loss on site will be limited and given that this loss will be located away from the key commuting routes, it is not considered likely that this habitat loss will significantly impact foraging and commuting bats on site. The habitat loss on site will therefore result in a **neutral effect** on foraging and commuting bats.
- 5.19 The implementation of a sensitive lighting scheme on site, and the retention and enhancement of existing tree line are considered sufficient to ensure the development will result in **neutral effect** for foraging and commuting bats.

Reptiles

- 5.20 A low population of slow worms and common lizards were recorded on the edges of the site. Where this habitat is to be impacted, notably on the southern aspect of the site for the construction of an acoustic fence, reptiles will have to be translocated resulting in a **minor negative impact**. The proposed development supports a receptor site along the northern edge of the site which can accommodate the reptiles once established. It is considered that if the reptile mitigation measures are employed it will ensure the development will result in **neutral effect** for common reptiles.

Badgers

- 5.21 The legislative protection for badgers applies to the animals and their setts for welfare purposes. As such, this assessment does not consider the loss of foraging habitat since the development will not isolate the setts or restrict the movement of badgers to feeding areas. An update walkover will be carried out prior to the commencement of works and can be secured through planning conditions. If any new setts are found to be within the development footprint following update surveys, then a Natural England mitigation licence will need to be applied for.
- 5.22 As badgers likely present within the local area, the following best practice methods will be adopted when working in the vicinity of known badger setts:
- Any trenches or excavations on site should be either covered over at night or a plank of wood placed in so as to allow any mammals to escape if the badgers were to accidentally fall in.
 - Any open pipes or conduits laid should be blocked off each night to prevent badgers from entering them.
 - Construction work should only take place between dawn and dusk with no late evening work. This will reduce possible disturbance to badgers as they emerge to forage and also reduce the risk of traffic casualties from late working site traffic.
 - All site workers will be informed of the known badger sett. Site workers must be informed that, by law, they must not:
 - Interfere with setts;
 - Dump equipment or litter in badger holes;

- Have fires next to badger holes;
- Damage or destroy the setts.

5.23 With the above mitigation in place, the development will produce a **neutral effect** on foraging and commuting badgers as a result of the proposed development.

Breeding birds

5.24 During the construction and operational phase there is likely to be an increase in means of disturbance to breeding birds from noise, vibration and increased local recreational pressure. The reaction to disturbance will vary among species, however given that the proposals involve the creation of compensatory habitats on site, the development will produce a **neutral effect**.

Other Species

5.25 The site was not considered to support dormice or GCNs, water voles or otters. The site did not support habitat suitable for stag beetles.

6.0 Cumulative effects

6.1 East Preston Neighbourhood Development Plan 2014-2029 does not identify major developments or increase in housing need, with small scale redevelopment recommended. Indeed the areas of open space are protected and no land has been identified for development. As such no cumulative impacts from East Preston are predicted.

6.2 The Kingston Parish Neighbourhood Plan (KPNP) does not identify any large scale development areas, with much of the area designated as the gap between settlements.

6.3 Angmering Neighbourhood Plan 2014 – 2029: Submission Version 4.0 identified the SHLAA sites which include development to the west of the A280 and around Roundstone Roundabout. These sites are Strategic Housing Site – part of Roundstone Lane Masterplan and have either been completed or currently being developed.

6.4 It is assumed that allocated sites will have considered potential impacts on species, habitats and protected/ designated sites.

6.5 There are numerous small scale developments within 2km of the site, including single storey extensions and small scale alterations. No cumulative impacts are considered likely to result from the on-site proposals and these small-scale developments.

6.6 The consented development is required, as a result of the planning process, to minimise effects on ecology through mitigation measures. The granting of planning permission for have been a result of assessing potential impacts on the surrounding habitats, including designated sites, as required by law and policy. This includes assessing the impacts alone and in combination with other projects and plans within the local landscape. Assuming that the nearby development has mitigation in place to negate any potential negative effects such as increased surface water run-off or increased visitor pressure, a cumulative impact from the developments would be insignificant.

7.0 Compensation

7.1 The proposed development results in the loss of areas of modified grassland which is in poor condition, with other smaller habitats including a small pocket of scrub which is more species diverse, albeit limited in quality and arable land. The loss of these habitats is not ecologically significant and as such there is no formal requirement for compensation.

7.2 However, the creation of POS, including an orchard along the northern tree line edge, is considered to sufficient to compensate for the loss of the limited habitats on site.

7.3 Compensation for the loss of reptile habitat will be made through the creation of an orchard habitat. This will be enhanced for reptiles and managed for the species. This habitat is linked along the northern edge of the site, which will allow species to move along the landscape.

8.0 Enhancement

8.1 The following enhancements are proposed are to be incorporated into the site design:

- Orchard planting to occur within shared open areas;
- Creation of one SuDS ponds with wetland planting;
- New scrub planting along the western and southern edges;
- Provision of integral bird and bat boxes;

-
- Provisions of hedgehog highways throughout the development;
 - Planting of a wildflower mix within the shared open areas;
 - Creation of an insect tower in the shared open area;
 - Long-term management of retained habitats to benefit wildlife.

9.0 Monitoring

- 9.1 Ecological clerk of works tasks will be required during construction, to ensure there is no change in the baseline that may alter the implementation of the development. All mitigation works, including the reptile translocation, must be undertaken under the supervision of a suitably qualified ecologist, this includes any update surveys required prior to development. Nesting bird checks will also be undertaken prior to habitat removal.

10.0 Summary and conclusions

- 10.1 The development at Old Worthing Road results in a change of land use into residential development with approximately 76 residential dwellings to be created with associated shared open space. Table 6 (below) summarises the effects on important features and how mitigation and compensation have been applied.

Baseline ecology and effects

- 10.2 The baseline features evaluated as important (through site designation, legislative protection or priority status on NERC Act 2006 Section 41 lists), so needing an assessment of effects, are as follows.
- 10.3 Important features offsite, but within the zone of influence of the development and have the potential to be impacted by increased recreational pressure, are:
- Ferring Rife and Meadows LWS;
 - Highdon Hill and Miller's Tomb LWS;
 - Goring and Ferring Gap LWS.
- 10.4 Features within or overlapping the red line that require an impact assessment are those determined as important in section 3, namely:

-
- The northern tree line
 - Bats;
 - Badgers;
 - Reptile,
 - Breeding birds.

Mitigation, compensation and enhancement

- 10.5 Embedded mitigation minimises the loss of habitats of value by retaining the northern tree line and the associated habitat edge. The provision of open space within the site master plan which supports features of ecological interest, and opportunities for on site recreation.
- 10.6 Residual impacts can be removed through compensation and these measures should be written into the planning conditions for the full planning application. The following compensation methods are recommended:
- A sensitive lighting scheme across the site;
 - Creation of new habitats, notably the orchard, scrub and reed beds.
- 10.7 Enhancements should be secured by condition and include new habitat creation and the use of bat and bird boxes and detailed in section 8.
- 10.8 Monitoring is required prior to the construction phase for badgers, who may create new setts and ensuring sensitive clearance of the site's habitats. Monitoring will also be required for the translocation work. Monitoring will also include an ecological clerk of works at construction phase and monitoring to ensure implementation of the conditions in addition to ensure there is no change in the baseline that may alter the implementation of the development.

Table 6: Features of the site where significant effects are predicted to from the development

Feature	Effect type and magnitude	Mitigation	Residual effect	Compensation to remove residual effects	Residual effect after compensation	Enhancement/biodiversity gain
Designated sites						
Ferring Rife and Meadows LWS;	Negligible impacts from increasing recreational pressure	None	Neutral		N/A	
Highdown Hill and Miller's Tomb LWS	Negligible impacts from increasing recreational pressure	None	Neutral	-	N/A	-
Goring and Ferring Gap LWS	Negligible impacts from increasing recreational pressure	None	Neutral	-	N/A	-
Priority habitats						
Off site habitats only	No impacts	None	Neutral	-	-	-
Priority and protected species						
Bats (foraging and commuting)	Minor negative, Light pollution causing indirect loss of habitats.	Retention and enhancement of commuting routes. Implementation of sensitive lighting scheme and enhancement planting	Neutral	-	-	Habitat creation and enhancement
Bats (roosting)	Neutral –trees with potential	None	Neutral	-	-	New bat boxes to be installed on site to create

	bat roosts to be retained.					new roosting opportunities.
Badgers	Neutral	Precautionary working practices to be implemented during construction.	Neutral	-		Habitat creation and enhancement
Breeding birds (active nests, all species)	Negative , damage to active nests and loss of habitat Potential predation from domestic cats from new residents	Construction works timing outside of breeding bird season or under ecological supervision	Neutral	Planting of replacement habitat.	Neutral	Additional nesting habitats planted Use of bird boxes
Reptiles	Minor Negative Presence confirmed	Retention and enhancement of the habitat along the northern edge. Creation of reptile receptor area and translocation of reptiles	Neutral			Habitat creation and enhancement with use of log piles and sensitive management

11.0 References

- Biggs, J.E., N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. & Dunn, F. (2014)., *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Defra Project WC1067. Freshwater Habitats Trust, Oxford.
- Bright, P., Morris, P. & Mitchell-Jones, T. (2006)., *The Dormouse Conservation Handbook*. 2nd edition. English Nature.
- CIEEM., (2018)., *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.
- Collins, J. (ed.)., (2016)., *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). Bat Conservation Trust, London.
- Cresswell, P., Harris, S. & Jefferies, D. J. (1990)., *The history, distribution, status and habitat requirements of the badger in Britain*. Nature Conservancy Council, Peterborough.
- Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. & Gregory, R. (2015)., *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. *British Birds*, **108**: 708-746.
- Froglife., (1999)., *Reptile survey: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife advice sheet 10. Available at: www.froglife.org/advice/sheets/htm
- Gent, T. & Gibson, S. (eds.)., (1998)., *Herpetofauna Workers Manual*. Joint Nature Conservation Committee, Peterborough.
- HS2., (2017)., *High Speed Two Phase One Information Paper. E28. Mitigation and Compensation*. HS2, Birmingham.
- Institution of Lighting Professionals (ILP)., (2018)., *Guidance Note 08/18 – Bats and artificial lighting in the UK*. ILP, Rugby.
- Joint Nature Conservation Committee (JNCC)., (2010)., *Handbook for Phase 1 habitat survey - a technique for environmental audit*. JNCC, Peterborough.
- Langton, T.E.S., Beckett, C.L. & Foster, J.P. (2001)., *Great Crested Newt Handbook*. Froglife, Halesworth.

Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C.A., McDonald, R.A. & Shore, R.F. (2018)., *A Review of the Population and Conservation Status of British Mammals: Technical Summary*. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough.

Musgrove, A. *et al.* (2013)., Population estimates of birds in Great Britain and the United Kingdom. *British Birds*. 106: 64 –100

Natural England., (2019)., Ancient Woodlands (England). Available at:

<https://data.gov.uk/dataset/9461f463-c363-4309-ae77-fdcd7e9df7d3/ancient-woodlands-england>

Oldham, R.S., Keeble, J., Swan, M.J.S. & Jeffcote, M. (2000)., Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal*, 10(4): 143-155.

Stone, E.L., Jones, G. & Harris, S. (2009) ., Street lighting disturbs commuting bats. *Current Biology*, 19: 1123-1127.

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

Stone, E.L., Jones, G., & Harris, S. (2015)., Impacts of artificial lighting on bats: A review of challenges and solutions. *Mammalian Biology*, 80: 213-219.

Sussex Bat Group., (2019)., Bats in Sussex. Available at: www.sussexbatgroup.org.uk/batsinsussex

Appendix A: The Ecology Partnership Preliminary Ecological Appraisal 2020

Preliminary Ecological Appraisal

Land Off Old Worthing Road,
East Preston,
West Sussex

Contents

1.0 INTRODUCTION.....	4
BACKGROUND	4
SITE CONTEXT AND STATUS	4
2.0 METHODOLOGY.....	6
DESKTOP STUDY	6
PRELIMINARY ECOLOGICAL APPRAISAL.....	6
PROTECTED SPECIES ASSESSMENTS.....	7
LIMITATIONS	7
3.0 RESULTS	8
DESKTOP STUDY	8
PHASE 1 HABITAT SURVEY.....	14
<i>BATS</i>	16
<i>REPTILES</i>	16
<i>BADGERS</i>	17
<i>OTHER SPECIES</i>	17
4.0 DISCUSSION.....	18
EFFECTS ON DESIGNATED SITES	18
EFFECTS ON PRIORITY HABITATS AND ONSITE HABITATS.....	18
EFFECTS ON PROTECTED SPECIES.....	20
SITE ENHANCEMENTS.....	24
5.0 IMPACT ASSESSMENT	25
6.0 CONCLUSIONS	27
7.0 REFERENCES	30
APPENDIX 1: PHASE 1 HABITAT MAP	32
APPENDIX 2: FULL SPECIES LIST	33
APPENDIX 3: PHOTO DOCUMENT.....	36
APPENDIX 4: BIOLOGICAL RECORDS.....	37

LIABILITIES:

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living animals and plants are capable of migration/establishing and whilst such species may not have been located during the survey duration, their presence may be found on a site at a later date.

This report provides a snapshot of the species that were present at the time of the survey only and does not consider seasonal variation. Furthermore, where access is limited or the site supports habitats which are densely vegetated only dominant species may be recorded.

The recommendations contained within this document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to or during works.

1.0 Introduction

Background

1.1 The Ecology Partnership was commissioned by Henry Adams to undertake a site assessment and preliminary ecological appraisal (PEA) of land to the south of Old Worthing Road, East Preston, West Sussex, BN12 6FD.

1.2 The key objectives of a PEA (CIEEM 2017) are to:

- Identify the likely ecological constraints associated with a project;
- Identify any mitigation measures likely to be required, following the 'Mitigation Hierarchy' (CIEEM 2016; BSI 2013, Clause 5.2);
- Identify any additional surveys that may be required to inform an Ecological Impact Assessment (EcIA); and
- Identify the opportunities offered by a project to deliver ecological enhancement.

1.3 This report comprises the:

- Legislative and planning context (Section 1);
- Assessment methodologies (Section 2);
- Results (Section 3);
- Implications for development (Section 4);
- An impact assessment (Section 5); and
- Conclusions (Section 6).

Site Context and Status

1.4 The site is situated on the eastern edge of the village of East Preston in West Sussex, approximately 4 miles west of the town of Worthing (TQ 08100 03089 – site centre point). The site is approximately 5.7ha in size.

1.5 The aerial photograph overleaf (Figure 1) shows the site and its immediate surroundings. The red line depicts the approximate site boundary and survey area.



Figure 1: Approximate location of the site, indicated by red line boundary (Image taken 18/08/2020 © 2020 Google)

Description of Proposed Development

- 1.6 The development proposals are for a residential development comprising 66 units with public open space provision and a landscape buffer zone.

Planning Policies

- 1.7 Any application will be assessed against the policy guidance provided by the National Planning Policy Framework, as well as relevant planning policies from the Arun District Council Local Plan Part 2011-2031. These policies included the following which are considered relevant to Ecology, Biodiversity and Nature Conservation:

- Policy ENV SP1: Natural Environment
- Policy ENV DM1: Designated Sites of biodiversity or geological importance
- Policy ENV DM2: Pagham Harbour
- Policy ENV DM4: Biodiversity Opportunity Areas
- Policy ENV DM4: Protection of trees
- Policy ENV DM5: Development and biodiversity

1.8 This report addresses the site in relation to nature conservation and wildlife, and the local planning requirements as well as national planning and nature conservation legislation.

1.9 The site was surveyed by The Ecology Partnership to assess its ecological value and to ensure compliance with national and local plan policies. This report has been produced with reference to current guidelines for preliminary ecological appraisal (CIEEM 2017) and in accordance with BS 42020:2013 Biodiversity – Code of Practice for Planning and Development.

2.0 Methodology

Desktop Study

2.1 A desktop study search was completed using an internet-based mapping service (www.magic.gov.uk) for statutory designated sites and an internet-based aerial mapping service (maps.google.co.uk) was used to understand the habitats present in and around the survey area and habitat linkages and features (ponds, woodlands etc.) within the wider landscape.

2.2 A 2km data search was requested from Sussex Biodiversity Record Centre. A search of 2km around the redline boundary, for protected species, statutory and non-statutory designated sites, was requested and the results of which have been processed in Table 1.

Preliminary Ecological Appraisal

2.3 An extended preliminary ecological appraisal was undertaken on 6th August 2020 by ecologists Jade Brennan BSc (Hons) MSc ACIEEM and Joel Cronin BSc (Hons) MSc QCIEEM. The surveyors identified the habitats present following the standard 'Phase 1

habitat survey' auditing method developed by the Joint Nature Conservancy Council (JNCC). The site was surveyed on foot and the existing habitats and land uses were recorded on an appropriately scaled map (JNCC 2010). In addition, the dominant plant species in each habitat were recorded. The potential of the site to support protected species was also assessed.

Protected Species Assessments

- 2.4 Any evidence of protected species was recorded. Standard methods of search and measures of presence, or likely absence based on habitat suitability were used for bats in trees and buildings (Collins 2016), breeding birds¹, dormice (Bright *et al.* 2006), great crested newts (ARG 2010), reptiles (Froglife 2015), badgers (Cresswell *et al.* 1990) and water voles (Strachan *et al.* 2011).

Limitations

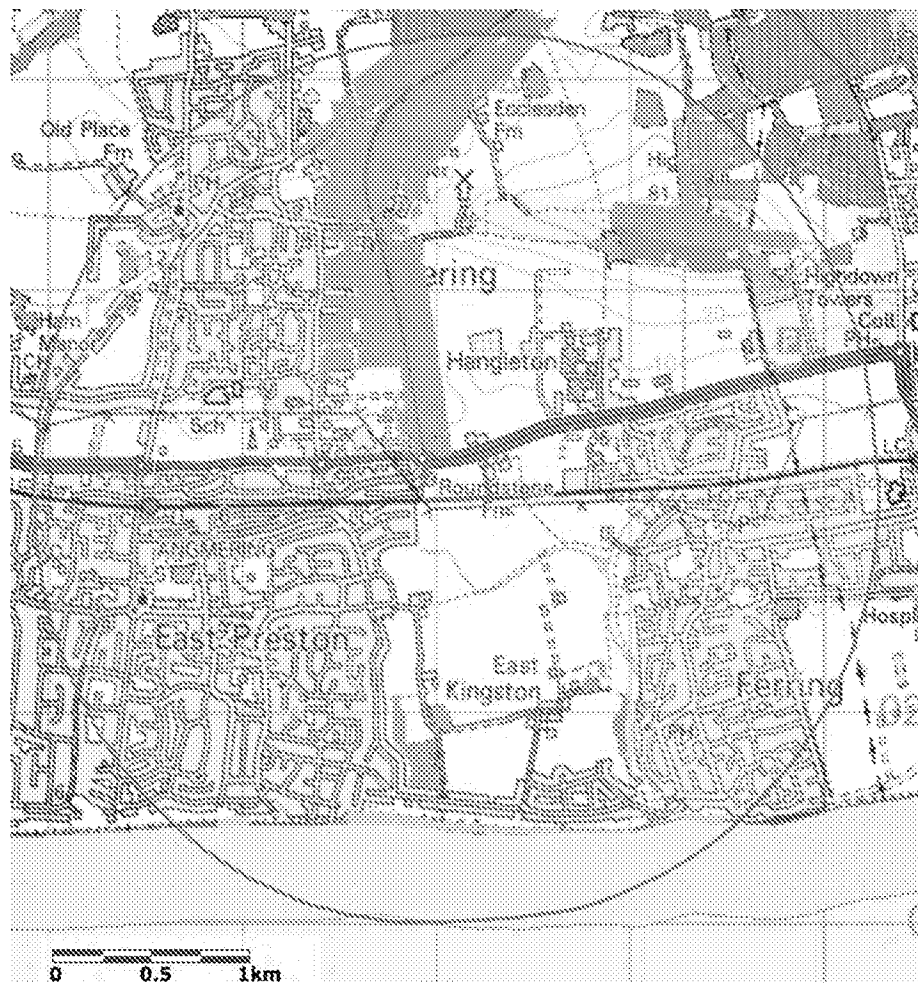
- 2.5 It should be noted that while every effort has been made to provide a comprehensive description of the site, no single investigation could ensure the complete characterisation and prediction of the natural environment. The site was visited over the period of one site visit, as such seasonal variations cannot be observed and potentially only a selection of all species that potentially occur within the site have been recorded. Therefore, the survey provides a general assessment of potential nature conservation value of the site and does not include a definitive plant species list.
- 2.6 The protected species assessment provides a preliminary view of the likelihood of protected species occurring on site, based on the suitability of the habitat and any direct evidence on site. It should not be taken as providing a full and definitive survey of any protected species group. The assessment is only valid for the time when the survey was carried out. Additional surveys may be recommended if, on the basis of this assessment, it is considered reasonably likely that protected species may be present.

¹ <https://www.bto.org/our-science/projects/birdatlas/methods/breeding-evidence>

3.0 Results

Desktop Study

- 3.1 There are no nationally designated sites within 2km of the red line boundary. The closest site is Climping Beach Site of Special Scientific Interest (SSSI) approximately 5.4km south west of the site.
- 3.2 There are no internationally designated sites within 10km of the site. The closest site is:
- Arun Valley (Special Area of Conservation – SAC, Special Protection Area – SPA, Ramsar and SSSI) approximately 11.1km north of the site
- 3.3 There are three Local Wildlife Sites (LWS) within 2km of the site boundary:
- Ferring Rife and Meadows approximately 500m south east of the site
 - Highdown Hill and the Miller's Tomb approximately 1.6km north east of the site
 - Goring and Ferring Gap approximately 1.8km south east of the site
- 3.4 The surrounding landscape is mainly dominated by residential development and agricultural fields and is on the eastern edge of the village of East Preston. However, there are a number of priority habitats within 2km of the site (Figure 2):
- Approximately 450m from the site were traditional orchards
 - Approximately 980m from the site was deciduous woodland
 - Approximately 1.1km from the site was coastal and floodplain grazing marsh
 - Approximately 1.2km from the site was lowland calcareous grassland
 - Approximately 1.2km from the site was lowland fens
 - Approximately 1.5km from the site was coastal vegetated shingle
 - Approximately 1.7km from the site was ancient and semi-natural woodland
- 3.5 No European Protected Species Licences were detected within 2km of the site boundary. No waterbodies were present within 250m of the site red line boundary (Figure 3).



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Figure 2: Priority habitats found within the wider landscape in relation to the site (site boundary shown in red with 2km buffer surrounding). Deciduous woodland is shown in dark green, ancient & semi-natural woodland with vertical brown hatching, lowland calcareous grassland in olive green, vegetated shingle in turquoise and coastal and floodplain grazing marsh in blue



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Figure 3: Waterbodies present within 250m of the red line boundary. The 250m buffer zone is shown in yellow. No ponds are shown to be present within the buffer area. Several drains are present.

3.6 A 2km data search for protected species was requested from Sussex Biodiversity Record Centre (SxBRC). The results are detailed in Table 1. This table includes species that are considered likely to use the habitats on site and are a high conservation priority.

Table 1: Protected species records located within 2km of the site boundary from the last 10 years as provided by SxBRC

Species	Status	Distance from site	Most recent record
Stag Beetle <i>Lucanus cervus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; Habitats Directive Annex 2; NERC Act (2006) Section 41; Bern Convention Appendix 3	Approximately 180m SW of the site	2019
Chalk Hill Blue <i>Polyommatus coridon</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41	Within 2km of the site	2015

Brown Hairstreak <i>Thecla betulae</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41	Within 2km of the site	2019
Great Crested Newt <i>Triturus cristatus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; Bern Convention Appendix 2; European Protected Species; Habitats Directive Annex 2 & 4; NERC Act (2006) Section 41	Approximately 1.5km SE of the site	2013
Slow Worm <i>Anguis fragilis</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41; Bern Convention Appendix 3	Approximately 770m NW of the site	2017
Western European Hedgehog <i>Erinaceus europaeus</i>	NERC Act (2006); Bern Convention Appendix 3	Approximately 250m W of the site	2019
European Water Vole <i>Arvicola amphibius</i>	Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41	Approximately 750m SE of the site	2019
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2017
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2011
Brown Long-eared <i>Plecotus Auritus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2011
Noctule Bat <i>Nyctalus noctula</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2011
Serotine Bat <i>Eptesicus serotinus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5	Within 2km of the site	2011
Barbastelle <i>Barbastella barbastellus</i>	Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4;	Within 2km of the site	2015

	Wildlife and Countryside Act (1981 as amended) Schedule 5		
Grey Partridge <i>Perdix perdix</i>	NERC Act (2006) Section 41; Birds Directive Annex 2.1; Red List BoCC	Within 2km of the site	2015
Red Kite <i>Milvus milvus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; Convention on Migratory Species Appendix 2	Within 2km of the site	2020
Hen Harrier <i>Circus cyaneus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; Convention on Migratory Species Appendix 2; NERC Act (2006) Section 41	Within 2km of the site	2012
Peregrine <i>Falco peregrinus</i>	Wildlife and Countryside Act (1981 as amended); Birds Directive Annex 1; Bern Convention Appendix 2	Within 2km of the site	2018
Hobby <i>Falco subbuteo</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Bern Convention Appendix 2	Within 2km of the site	2018
Merlin <i>Falco columbarius</i>	Wildlife and Countryside Act (1981 as amended); Birds Directive Annex 1; Red List BoCC	Within 2km of the site	2012
Ringed Plover <i>Charadrius hiaticula</i>	BoCC Red List	Within 2km of the site	2018
Whimbrel <i>Numenius phaeopus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; BoCC Red List	Within 2km of the site	2018
Curlew <i>Numenius arquata</i>	Birds Directive Annex 2.2; Convention on Migratory Species Appendix 2; NERC Act (2006) Section 41	Within 2km of the site	2012
Woodcock <i>Scolopax rusticola</i>	NERC Act (2006) Section 41; BoCC Red List	Within 2km of the site	2018
Lapwing <i>Vanellus vanellus</i>	Birds Directive Annex 2.2; Convention on Migratory Species Appendix 2; NERC Act (2006) Section 41	Within 2km of the site	2018
Black-tailed Godwit <i>Limosa limosa</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; BoCC Red List	Within 2km of the site	2018
Green Sandpiper <i>Tringa ochropus</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km of the site	2013
Turtle Dove <i>Streptopelia turtur</i>	Birds Directive Annex 2.2; NERC Act (2006) Section 41	Within 2km of the site	2014

Cuckoo <i>Cuculus canorus</i>	NERC Act (2006) Section 41; BoCC Red List	Within 2km of the site	2011
Hoopoe <i>Upupa epops</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km of the site	2015
Grasshopper Warbler <i>Locustella naevia</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2014
Wood Warbler <i>Phylloscopus sibilatrix</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2014
Woodlark <i>Lullula arborea</i>	Birds Directive Annex 1; Wildlife and Countryside Act (1981 as amended) Schedule 1; NERC Act (2006) Section 41	Within 2km of the site	2010
Skylark <i>Alauda arvensis</i>	NERC Act (2006) Section 41; Birds Directive Annex 2.2	Within 2km of the site	2019
Tree Pipit <i>Anthus trivialis</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2016
Yellow Wagtail <i>Motacilla flava</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Grey Wagtail <i>Motacilla cinerea</i>	Red List BoCC	Within 2km of the site	2018
Black Redstart <i>Phoenicurus ochruros</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Bern Convention Appendix 2; Red List BoCC	Within 2km of the site	2014
Whinchat <i>Saxicola rubetra</i>	Red List BoCC	Within 2km of the site	2018
Ring Ouzel <i>Turdus torquatus</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2017
Fieldfare <i>Turdus pilaris</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Birds Directive Annex 2.2; Red List BoCC	Within 2km of the site	2018
Song Thrush <i>Turdus philomelos</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2020
Redwing <i>Turdus iliacus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1; Birds Directive Annex 2.2; Red List BoCC	Within 2km of the site	2018
Mistle Thrush <i>Turdus viscivorus</i>	Red List BoCC	Within 2km of the site	2017
Spotted flycatcher <i>Muscicapa striata</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Pied Flycatcher <i>Ficedula hypoleuca</i>	Red List BoCC	Within 2km of the site	2013
Firecrest <i>Regulus ignicapillus</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km of the site	2016
Starling <i>Sturnus vulgaris</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
House Sparrow <i>Passer domesticus</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018

Lesser Redpoll <i>Acanthis cabaret</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2015
Linnet <i>Linaria cannabina</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Brambling <i>Fringilla montifringilla</i>	Wildlife and Countryside Act (1981 as amended) Schedule 1	Within 2km of the site	2010
Hawfinch <i>Coccothraustes coccothraustes</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Yellowhammer <i>Emberiza citronella</i>	NERC Act (2006) Section 41; Red List BoCC	Within 2km of the site	2018
Reed Bunting <i>Emberiza schoeniclus</i>	Wildlife and Countryside Act (1981 as amended); Amber List BoCC; UK BAP	Within 2km of the site	2018

*Additional species may be present within the records list that are not considered to use the habitats on site.

Phase 1 Habitat Survey

- 3.7 The survey allows for a general site assessment of the flora present on site and the broad habitats present on site.
- 3.8 The site consisted of an arable field and associated uncultivated margins. The northern and western site boundaries supported tree lines. The southern site boundary bordered a railway and the western site boundary backed onto residential properties. The plant species abundances on site were assessed using the DAFOR scale where appropriate. DAFOR scores and scientific names are listed in Appendix 2.

Semi-Improved Grassland

- 3.9 The field margins consisted of semi-improved grassland. At the time of the survey these areas had a high sward height and supported a variety of different species, including: perennial ryegrass, false oat grass, Yorkshire fog, bristly ox tongue, wall barley, burdock, fat hen, scented mayweed, bindweed, couch grass, common nettle, soft brome, common mallow, oilseed rape, hogweed, ivy, bramble, hedge mustard, mugwort, petty spurge, dandelion, groundsel, creeping thistle, knotgrass, broad leaved dock, pendulous sedge, black bryony, woody nightshade, Oxford ragwort.

Scrub

- 3.10 Growing along the southern site boundary was a long strip of scrub that extended onto the railway embankment past the site boundary. Species present included: bramble, common nettle, elder, buddleia, goat willow.

Tree Lines

- 3.11 Along the northern edge of the site and western edge of the site were lines of trees. Tree species present along the northern site boundary included: Leyland cypress, Austrian pine, blackthorn, prunus sp., hawthorn. Tree species present along the western site boundary included: poplar.

Arable

- 3.12 The site was dominated by stubble from a recently harvested arable crop that covered the central section of the site. No other plant species were present within this area.

Hardstanding

- 3.13 From the north west corner of the site to the east boundary was a hardstanding accessway. This area supported no plants.

Target Notes²

Target Note 1 -Mammal digging was noted

Target Note2 – A brash pile was noted

² See Appendix 1 for Habitat Map showing target note locations

Protected Species

Bats

- 3.14 There were no buildings on site to assess for roosting bat potential.
- 3.15 The tree lines and scrub present on site offer moderate suitability for commuting and foraging bats. They were both limited in their species diversity. The A269 is also present on the other side of the northern boundary tree line.
- 3.16 The tree line along the northern site boundary supported a number of trees with “low” roosting bat potential and some were also covered with ivy. Trees were assigned roosting potential on the basis of their maturity and size in addition to any observed features typically associated with roosting bats.
- 3.17 The habitat surrounding the site was largely comprised of residential development and arable land. The site has limited connectivity across the landscape as the A259 runs along the northern boundary and a railway runs along the southern boundary.

Reptiles

- 3.18 The majority of the site consisted of crop stubble which offered negligible suitability for reptile species. The tree lines, semi-improved grassland and areas of scrub offered some suitability for common reptile species. The southern site boundary backed onto a railway and supported a line of scrub which provided good suitability for common reptile species. A brash pile was also noted along the western site boundary which could provide a hibernaculum for common reptile species (Appendix 1).

Dormice

- 3.19 The site boundaries along the northern and eastern edges supported tree lines, but both tree lines had very limited understories. The southern site boundary supported a line of thick scrub which was considered to have some superficial suitability for dormice. The species present in this area provided some suitable food sources for dormice and some limited connectivity to off-site scrub sections and garden areas. There was no connectivity to any large tracts of suitable habitat such as deciduous woodland. There are no records

for dormice in the last 2 years and within 2km of the site and there are no protected species licences for dormice within 2km of the site.

Badgers

- 3.20 No setts or other evidence of badger presence or activity were detected during the survey. However, some mammal digging was detected in the south west corner of the site around two large pipes that appeared to extend under the railway line. This area could not be fully investigated at the time of survey due to the presence of dense vegetation. With the agricultural surroundings of the site, badgers may be to be present in the local landscape and may venture on to the site for foraging and commuting purposes.

Great Crested Newts (GCN)

- 3.21 There were no waterbodies identified within 250m of the red line boundary (Figure 3). However, one waterbody, located approximately 270m from the site supported low water levels and the ditch, extending around the edges of the site were dry at the time of the survey. A further pond was located over 400m from the redline boundary.
- 3.22 Both waterbodies were separated from the site by a railway line and agricultural land. Together these features are considered to provide a sufficient separation barrier from the site for GCN.
- 3.23 The areas of scrub, and semi-improved grassland all offered potential habitat for GCN during their terrestrial phase. The nearest granted GCN licence is approximately 3.6km north west of the site and on the far side of the A259.

Other Species

- 3.24 The scrub areas and trees on site were considered to have potential to support nesting birds with several common bird species seen on site at the time of the survey. The arable crop and grassland margins also had some potential to support ground nesting birds.

-
- 3.25 Due to a lack of suitable habitat, no potential for any other protected species, such as otters or water voles, was identified within the site. These are not considered further within the assessment.

4.0 Discussion

- 4.1 The following paragraphs consider the effects of the development on designated sites, priority habitats and protected and priority species. Where the desk study and Phase 1 survey provide insufficient evidence for an assessment of effects on any of these groups to be taken through planning, the need for additional surveys and when and how these should be completed are summarised, if required.

Effects on Designated Sites

- 4.2 There are no statutory designations on or adjacent to the site. There are no internationally designated sites within 10km of the site. The closest international designation is: Arun Valley (SAC, SPA, Ramsar, SSSI) approximately 11.1km north of the site. At this distance no impacts, direct or indirect, to the site or its qualifying features are predicted.
- 4.3 The closest designation is Climping Beach Site of Special Scientific Interest (SSSI) approximately 5.4km south west of the site. The site lies outside the impact zone for this SSSI unit. As such no impacts to the site, direct or indirect, are predicted.
- 4.4 The other SSSIs within the wider landscape are of sufficient distance as to rule out any predicted impacts resulting from the development proposals.

Effects on Priority Habitats and Onsite Habitats

- 4.5 The closest priority habitat is an area of traditional orchards located approximately 450m north west of the site. This area is buffered from the site by the A259 and residential development. Other priority habitats are located over 900m from the site.
- 4.6 Considering the distances from the proposed development site and other off site priority habitats, it is considered no impacts such as habitat loss, isolation, or fragmentation, would occur as a result of the development.

-
- 4.7 The site is dominated by arable crop with semi-improved grassland margins, tree lines, scrub areas and a section of hardstanding. The arable crop was considered to be of no botanical interest and the hardstanding supported no plants. The loss or removal of these habitats would not be considered to result in a significant impact as these habitats are common and widespread.
- 4.8 The tree lines and scrub areas were the most ecologically valuable features on site. These both formed part of the green infrastructure of the local area. These areas were limited in their extent, but should be considered in terms of provision of local interest.
- 4.9 The grassland habitats along the field margins had a high sward height and mix of species. It is recommended that these areas are retained where possible to maintain ecological connectivity across the site. These areas should be considered in terms of site interest.
- 4.10 The proposal are for a residential development. The tree lines and scrub along the southern boundary should be retained and protected during site works and tree protection should follow recommendations from an arboriculturalist in terms of root protection areas. The field margins have also been recommended to be retained. To achieve a net gain any losses will have to be compensated for on or off site. It is considered that enhancements can be made which would increase the ecological value of the site post-development. Such enhancements are outlined further below and would contribute to providing a net gain in line with local and national policy.
- 4.11 The arable crop habitat was of negligible ecological interest. As this area is considered to be of no botanical interest, the loss or removal of this habitat would not be considered to be a significant impact. However, in order to seek a 'net gain' the loss of this area is likely to require compensation.
- 4.12 Mitigation for this would include a species rich planting scheme around the edges of the site and potentially off-site planting. The introduction of new public open spaces would also provide space for species-rich native planting within the site. The maintenance and enhancement of tree lines, the use of wildflower meadows and SUDS creation, would aim to improve the ecological value of the site.

-
- 4.13 The habitats within the red line boundary have been assessed for their potential to support a number of protected species. These are discussed individually below.

Effects on Protected Species

Bats

- 4.14 There were no buildings on site to assess for potential to support roosting bats.
- 4.15 Any proposed development must consider ecological networks and green infrastructure, in line with both national and local policies. As such, the tree lines should be retained and enhanced, in addition to remaining unlit to preserve their ecological functionality for foraging and commuting bats.
- 4.16 A number of mature trees within the northern boundary tree line were identified as having 'low' roosting bat potential. These trees are recommended to be retained within any future development. These trees should also be kept within darkened corridors/wildlife corridors and remain unlit, to avoid negative impacts on roosting bats. Any trees which have been identified as having 'low' bat roosting potential are recommended to be soft felled should they require removal. If works to any of the mature trees on site, especially within the northern boundary tree line, are required then it is recommended that an update survey of these trees is undertaken by a suitably qualified ecologist prior to the commencement of any works.
- 4.17 The field boundaries on site have some suitability for foraging and commuting bats in the local area. Some suitable habitats are also located within the local surroundings, but are separated from the site by the A259. The scrub adjacent to the railway line and the tree lines are to be retained, with new tree planting proposed to form a landscape buffer along the northern edge of the site and on the western area of the site. The habitats which are to be lost and impacted upon are largely contained within the arable landscape. This habitat type is of limited value for bats.
- 4.18 Considering the above, it is recommended that transect surveys are not required. However, as bats are considered likely to use the tree lines and boundary features on site,

these areas would need to be retained as dark corridors or sections with no significant increase in external lighting. Bats are known to be influenced by light levels, which can affect both their roosting and foraging behaviour. This needs to be considered with a sympathetic lighting scheme used for proposals if any artificial lighting is required. The following guidance is taken from The Bat Conservation Trust guidance. Recommendations include, but are not limited to:

- Installing lighting only if there is a significant need;
- Using LED luminaires due to their lower intensity, sharp cut-off and good colour rendition – any lights with UV elements or metal halide lights should not be used;
- Lights with peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone 2012);
- Lights with an upward light ratio of 0% and good optical control;
- Careful consideration of column height to avoid light spill;
- Avoid putting lighting near tree lines or hedgerows and angling light away from these linear features which are used by commuting and foraging bats;
- Planting a barrier or using man-made features required within the scheme to form a barrier.

4.19 It is also recommended that any development should incorporate bat friendly features such as brick bat houses and/or bat tubes in order to enhance the roosting opportunities for bats in the area. The use of integral bat boxes is recommended. They are unobtrusive and can fit flush into the masonry of a wall. It is recommended that these are placed on unlit or south facing walls.

4.20 Bat boxes should also be erected on retained mature trees post-development to provide new roosting opportunities for bats. Suitable bat boxes include a variety of woodcrete or similarly constructed bat boxes as these are long-lasting and require minimal maintenance. Recommended boxes include:

- Vivara Pro WoodStone Bat Box – A general purpose bat box that supports a range of species (Figure 4). These can be hung on trees in a variety of heights and aspects in order to provide a variety of micro-climates.

- Large Multi Chamber WoodStone Bat Box – This is a multipurpose box designed for larger colonies and a range of bat species including pipistrelles, noctules and brown long-eared bats. These should be hung on mature trees around the site (Figure 4)

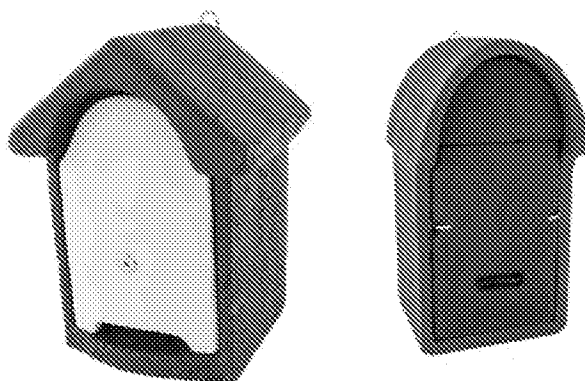


Figure 4: Vivara Pro WoodStone Bat Box (left) and Large Multi Chamber WoodStone Bat Box (right)

Reptiles

- 4.21 The tree lines, semi-improved grassland and areas of scrub offered some suitability for reptiles. It is recommended that further survey work be undertaken to establish if a population of reptiles is present on site and the size of the population. It appears likely that these habitats will be impacted by site proposals.
- 4.22 If reptiles are identified then a suitable mitigation strategy would be required in order to maintain either the population on site, or translocated them off site to a long term suitable habitat.

Dormice

- 4.23 There was some, albeit superficially, suitable habitat present on site for dormice in the form of a linear section of scrub along the southern boundary totalling approximately 330m. This area had limited connectivity to other areas of scrub and back gardens off site and had no connectivity to off-site areas of deciduous woodland or other suitable habitat capable of supporting a dormouse population. Due to the isolation of this habitat area and the lack of dormouse records within the local area it is considered unlikely that dormice

would be present on site and no further surveys for this species are recommended. The site is not considered to be constrained by this species.

Badgers

- 4.24 Some mammal digging was detected in the south west corner of the site around two large pipes emerging from under the railway line. It is possible that these pipes are in use by badgers. It is recommended that this area is retained in its current state as part of the future development and a buffer zone (dependent on the locations of any tunnels and the activity of the holes) should be placed around the area where no building or significant digging works can take place. If a suitable buffer is not possible then further monitoring may be required to ascertain whether this area is in use by badgers and to what extent. The retention of the tree lines and field margins and provision of enhanced ecological networks, would ensure that badger access to foraging habitats and water is retained.
- 4.25 It is always recommended that update badger surveys are conducted across the site prior to any works being undertaken as badgers can move onto the site between the initial survey and the commencement of work.

Great Crested Newts (GCN)

- 4.26 There are no waterbodies on site or ponds within 250m of the site. There are two ponds located to the south of the railway line over 250m from the site. The drainage ditches were dry at the time of the survey.
- 4.27 Considering the loss of habitat is largely restricted to arable land, which is considered sub optimal for GCNs, the proposed development is considered unlikely to impact GCNs, as per Natural England licence risk assessment below in figure 5. As such no further surveys are recommended, and it is considered that the site is not constrained by the presence of this species.

Component	Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	National offence probability
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	No effect	0
Land 100-250m from any breeding pond(s)	No effect	0
Land >250m from any breeding pond(s)	1 - 5 ha lost or damaged	0.14
Individual great crested newts	No effect	0
Rapid risk assessment result:	GREEN: 0	0.14

Guidance on risk assessment result categories

"Green: offence highly unlikely" indicates that the development activities are of such a type, scale and location that it is highly unlikely any offence would be committed should the development proceed. Therefore, no licence would be required. However, bearing in mind that this is a generic assessment, you should carefully examine your specific plans to ensure this is a sound conclusion, and take precautions (see **Non-licensed avoidance measures tool**) to avoid offences if appropriate. It is likely that any residual offences would have negligible impact on conservation status, and enforcement of such breaches is unlikely to be in the public interest.

Figure 5: Natural England licence risk assessment

Other species

- 4.28 It is recommended that if any trees or sections of scrub are to be removed, or have work done, that these works should be undertaken outside the breeding bird season (March–September inclusive) or immediately after a nesting bird check by a suitably qualified ecologist. The same applies to works to take place in the arable crop and grassland margin areas as these sections could support ground nesting birds. If active nests are identified, works in the vicinity of the nest must cease until the birds have fledged the nest.

Site Enhancements

- 4.29 Site enhancements have been recommended to improve the quality of the site for protected species, provide net gains to biodiversity post-development and to ensure that the proposals comply with local planning policy. It is important to use native species of local provenance in landscaping schemes to enhance the ecological value of a development.
- 4.30 All trees are recommended to be retained where possible. Trees provide foraging opportunities for bats through the provision of insect prey and as such it is recommended that a number of the following native tree species are planted along the site boundaries, infilling gaps, as well as along internal streets and across the site post-development for any future development. These enhancements will help to improve wildlife corridors around the site for species such as bats, badgers, amphibians, small mammals and birds.

-
- 4.31 Bird boxes should also be installed on site to provide additional nesting opportunities for birds. Recommended boxes include Schwegler bird nest boxes or other similar woodcrete bird nest boxes. They can be placed on trees post-development.
- 4.32 Additional habitat can be created for a variety of species in the form of green walls on new buildings / fence lines which provide additional habitats for birds and insects and in turn foraging opportunities for bats. Climbing plants can be grown onto a trellis or trained these directly onto walls or fence lines. A combination of species should include clematis:
- Honeysuckle (*Lonicera japonica*; *L. fragrantissima*; *L. standishii*)
 - Clematis (*Clematis vitalba*, *C. armandii*, *C. alpina*, *C. montana*, *C. tangutica*)
 - Ivy (*Hedera helix*)
 - Climbing hydrangea (*Hydrangea petiolaris*)
 - Dog rose (*Rosa canina*)
- 4.33 Log and brush piles should be created under hedgerows to provide refugia and hibernacula for amphibians, reptiles, small mammals and invertebrates. Log piles should be located in a variety of locations, such as damp places, with some situated in more sunny locations.

5.0 Impact Assessment

- 5.1 This section of the report forms an EcIA (Ecological Impact Assessment) and is designed to quantify and evaluate the potential impacts of the development on habitats and species present on site, or within the local area.

Methodology

- 5.2 The approach to this assessment accords with guidance presented within the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM 2018). In essence, an EcIA assesses the activities associated with a proposed scheme that are likely to generate changes within identified zone of influence, on identified ecological features and receptors. The proposals are subsequently reviewed and mitigation and compensation measures are outlined which help to reduce negative impacts.
- 5.3 The zone of influence of the development is defined as:

- The project red line, for effects on habitats and species;
- Adjacent habitat, considered by species, for mobile species with territories or foraging ranges that may overlap the site

5.4 Types of features considered in the assessment of effects, to meet legislative and policy requirements, are:

- Designated sites (European, national and local);
- Protected species;
- Habitats and species of principal importance (Section 41 list);
- Hedgerows and woodland, where not of principal importance; and
- Habitats, where not of principal importance, that may function as wildlife corridors or stepping stones

Baseline Ecological Conditions

5.5 The site contains the following important ecological features:

- Tree and scrub lines

5.6 In addition, the site is considered to have potential to support the following important ecological features:

- Bats
- Reptiles
- Badgers
- Nesting birds

Table 2: Assessment of effects from the proposal after mitigation and compensation

Feature	Scale of Importance	Mitigation/Compensation Required	Residual Effect
Climping Beach SSSI	National	No impacts predicted	Not significant
Local Wildlife Sites	Local	No impacts predicted	Not significant

Offsite priority habitats	Local	No impacts predicted	Not significant
Tree and scrub lines	Local	Avoiding harm by retaining the tree lines within the proposals and replacing if removal is absolutely necessary	Not significant
Bats	Local	Sensitive lighting scheme and the retention of the boundary habitats on site that act as potential foraging and commuting routes.	Not significant
Reptiles	Local	Dependant on results of further reptile surveys. Likely to involve retention of suitable margin habitat and sensitive clearance for any areas requiring removal	Undetermined
Nesting Birds	Local	Mitigating direct harm to nests by removal of any suitable habitat outside of nesting bird season or after a check by a suitably qualified ecologist Compensation in the form of the installation of bird boxes and replacement planting	Not significant
Badgers	Local	Suitable buffer from the development maintained. Precautionary method of works during construction	Not significant

Summary

5.7 The scheme should also be considered in conjunction with other surrounding proposals to determine cumulative impacts on ecological features. The closest statutory site is Climbing Beach (SSSI) approximately 5.4km south west of the site. At this distance no indirect impacts from the development are predicted on this SSSI. The development site also lies outside the zone of influence for this SSSI. The development site is largely arable crop and it is considered that mitigation for any habitat losses will be achievable on site. A more detailed mitigation and enhancement plan will be possible once the proposals are finalised.

6.0 Conclusions

6.1 The site consists primarily of arable cropland with surrounding tree lines and field margins. The site is surrounded by agricultural fields to the north and south and residential development to the east and west.

-
- 6.2 The habitats on site are considered to have potential for supporting bats, reptiles, badgers and nesting birds. It is recommended that the tree lines, linear scrub and grassland field margins are retained, enhanced and suitably buffered from any future development.
- 6.3 There were no standing structures on site to assess for roosting bat potential. A number of the trees along the northern boundary were identified as having roosting bat potential. It is recommended that all mature trees are retained and buffered from any future development. Should any trees require removal, it is recommended that an update survey of all trees on site is conducted prior to any tree removal.
- 6.4 The tree lines, linear scrub and boundary features on site could provide foraging and commuting opportunities for bats. These features are to be retained and enhanced as part of the proposals. As such no further surveys are recommended at this time. If tree lines are to be impacted, then further surveys would be required.
- 6.5 A sensitive lighting scheme for the perimeter of the site, and the hedgerows and tree line in particular, has been recommended. Enhancement planting for the tree lines has also been recommended.
- 6.6 The tree lines, scrub and field margins on site have potential to support common reptile species. With sections of the site being suitable, further reptile surveys have been recommended.
- 6.7 Some mammal digging was present in the south west corner of the site, but no other evidence of possible badger presence was detected on site. It has been recommended that this area is retained and suitably buffered from the site. Given the agricultural surroundings of the site it is considered likely that badgers are present in the local area and potentially the site and may use the site for foraging and commuting purposes. Precautionary methods of working have been outlined to account for this species. Update surveys prior to the commencement of works have also been recommended and further surveys may be required dependant on the final proposals.
- 6.8 There is potential for nesting birds within the trees, scrub and arable crop on site. If any suitable habitat is to be removed it should be undertaken outside of the nesting bird season (March-September) inclusive, or after a nesting bird check by a suitably qualified ecologist.

- 6.9 The site was not considered to be constrained by the presence of dormice or great crested newts and no further surveys for these species have been recommended.
- 6.10 Recommendations for enhancements have been made within this report, aimed at improving the ecological value of the site and providing a net gain in biodiversity post-development.

7.0 References

ARG (2010) *UK Advice Note 5: Great crested newt habitat suitability index*. Amphibian and Reptile Groups of the United Kingdom.

Bright, P., Morris, P. & Mitchell-Jones, T. (2006) *The Dormouse Conservation Handbook*. 2nd edition. English Nature.

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

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

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

Creswell, P., Harris, S. & Jeffries, D.J. (1990) *The history, distribution status and habitat requirements of the badger in Britain*. Nature Conservancy Council, Peterborough.

English Nature (2004) *Reptiles: guidelines for developers*. English Nature, Peterborough.

Joint Nature Conservation Committee (2010) *Handbook for Phase 1 habitat survey – a techniques for environmental audit*. JNCC, Peterborough.

Institution of Lighting Professionals (ILP - 2018) *Guidance Note 08/18 – Bats and artificial lighting in the UK*. ILP, Rugby.

Langton, T.E.S., Beckett, C.L. & Foster, J.P. (2001) *Great Crested Newt Handbook*. Froglife, Halesworth.

Mitchell-Jones, A.J. (2004) *Bat Mitigation Guidelines*. English Nature, Peterborough.

Natural England (2001) *Great Crested Newt Mitigation Guidelines*. Natural England, Peterborough.

Natural England (2010) *European Protected Species and the Planning Process*. www.naturalengland.org.uk.

Natural England (2011) *Badgers and Development: A guide to best practice and licensing*. Natural England, Bristol.

Neal, E. & Cheeseman, C. (1996) *Badgers*. T & A D Poyser Ltd. London.

Stone, E.L., Jones, G. & Harris, S. (2012) Conserving energy at a cost to biodiversity? Impacts of LED lighting on bats. *Global Change Biology*, **18(8)**: 2458-2465.

Stroh, P.A., Leach, S.J., August, T.A., Walker, K.J., Pearman, D.A., Rumsey, F.J., Harrower, C.A., Fay, M.F., Martin, J.P., Pankhurst, T., Preston, C.D. & Taylor, I. (2014) *A Vascular Red Plant List for England*. Botanical Society of Britain and Ireland, Bristol.

Strachan, R. & Moorhouse, T. (2006) *Water vole conservation handbook*. Wildlife Conservation Research Unit, University of Oxford.

Sussex Wildlife Trust (2016) *Survey Manual for Otter Spotters*. Published online – accessed December 2019.

Wilson, G.J., Harris, S. & McLaren, G. (1997) *Changes in British badger population, 1988-1997*. People's Trust for Endangered Species, London.

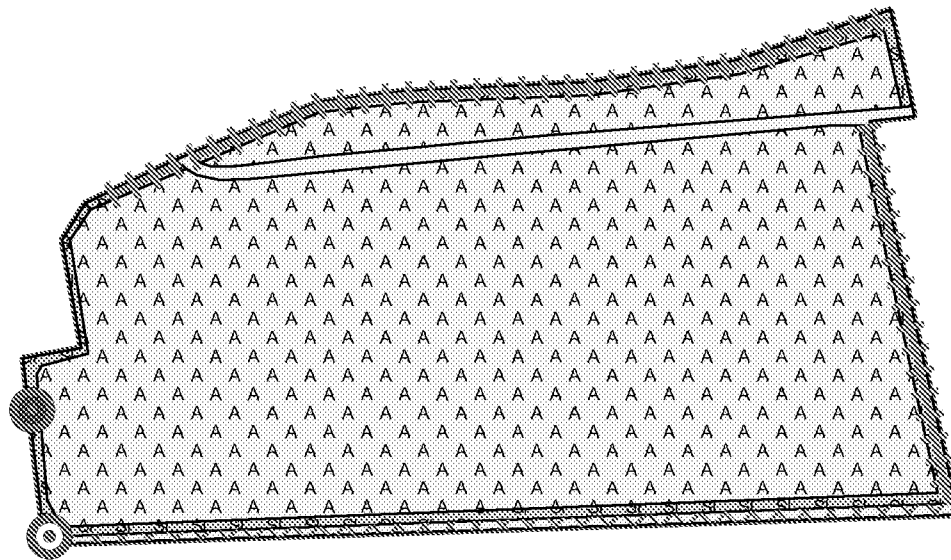
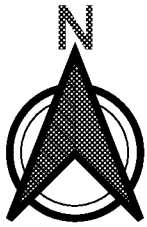
Internet resources:

Google Maps: www.google.co.uk/maps

Magic Interactive Map: www.magic.gov.uk

Arun District Council: <https://www.arun.gov.uk/>

Appendix 1: Phase 1 Habitat Map



Legend

-  Target Note 2 - Brash Pile
-  Target Note 1 - Mammal Digging
-  Tree Line
-  Scrub
-  Hardstanding
-  Semi-Improved Grassland
-  Arable Crop
-  Old Worthing Road Redline

Site: Land Off Old Worthing Road

Client: Henry Adams

Survey Date: 6th August 2020

Surveyors: Jade Brennan and Joel Cronin

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Appendix 2: Full Species List

Common name	Latin name	DAFOR score
Semi-Improved Grassland		
Perennial rye-grass	<i>Lolium perenne</i>	A
False oat grass	<i>Arrhenatherum elatius</i>	A
Yorkshire fog	<i>Holcus lanatus</i>	F
Bristly ox tongue	<i>Helminthotheca echioides</i>	F
Wall barley	<i>Hordeum murinum</i>	O
Burdock	<i>Arctium</i> sp.	O
Fat hen	<i>Chenopodium album</i>	O
Scented mayweed	<i>Matricaria chamomilla</i>	O
Bindweed	<i>Calystegia/Convolvulus</i>	O
Couch grass	<i>Elymus repens</i>	O
Common nettle	<i>Urtica dioica</i>	O
Soft brome	<i>Bromus hordeaceus</i>	O
Common mallow	<i>Malva sylvestris</i>	R
Oilseed rape	<i>Brassica napus</i>	R
Soft rush	<i>Juncus effusus</i>	R
Prickly sow thistle	<i>Sonchus asper</i>	R
Hogweed	<i>Heracleum Sphondylium</i>	R
Ivy	<i>Hedera helix</i>	R
Bramble	<i>Rubus fruticosus</i>	R
Hedge mustard	<i>Sisymbrium officinale</i>	R
Mugwort	<i>Artemesia vulgaris</i>	R

Petty spurge	<i>Euphorbia peplus</i>	R
Dandelion	<i>Taraxacum officinale</i>	R
Groundsel	<i>Senecio vulgaris</i>	R
Creeping thistle	<i>Cirsium arvense</i>	R
Knotgrass	<i>Polygonum aviculare</i>	R
Broad leaved dock	<i>Rumex obtusifolius</i>	R
Pendulous sedge	<i>Carex pendula</i>	R
Black bryony	<i>Dioscorea communis</i>	R
Woody nightshade	<i>Solanum dulcamara</i>	R
Oxford ragwort	<i>Senecio squalidus</i>	R
Scrub		
Bramble	<i>Rubus fruticosus</i>	D
Common nettle	<i>Urtica dioica</i>	F
Elder	<i>Sambucus nigra</i>	O
Buddleia	<i>Buddleia davidii</i>	O
Goat willow	<i>Salix caprea</i>	O
Tree Line (North)		
Leyland cypress	<i>Argentina anserina</i>	F
Austrian pine	<i>Urtica dioica</i>	F
Blackthorn	<i>Prunus spinosa</i>	O
Prunus	<i>Prunus sp.</i>	O
Hawthorn	<i>Polygonum aviculare</i>	O
Tree Line (South)		
Poplar	<i>Populus sp.</i>	D

Appendix 3: Photo Document

Photo 1:
Image of the northern tree
line with semi-improved
grassland underneath and
arable crop and
hardstanding in the
foreground



Photo 2:
View of the arable crop
area with the hardstanding
through the middle



Photo 3:
View of the eastern tree
line with semi-improved
grassland underneath and
arable crop on the right
hand side and scrub in the
background



Photo 4:
View of the scrub section
along the southern
boundary with semi-
improved grassland in
front



Photo 5:
View of the western
boundary showing semi-
improved grassland with
houses behind



Photo 6:
View of one of the pipes in
the south west corner
where mammal digging
was detected



Photo 7:
View of the north west
corner of the site with
semi-improved grassland
along the edge and the
northern tree line
beginning in the
background



Appendix 4: Biological Records

Ecological Data Search SxBRC/20/355 - Summary Report

An ecological data search was carried out for land at Old Worthing Road and Kingston Lane, East Preston on behalf of Joel Cronin (The Ecology Partnership) on 18/08/2020.

The following datasets were consulted for this report:

	Requested	Radius/buffer size
Designated sites, habitats & ownership maps	Yes	2km
Protected, designated and invasive species	Yes	2km

Summary of results

Sites and habitats

Statutory sites	1 National Park
Non-statutory sites	3 LWS
Section 41 habitats	8 habitats
Ancient and/or ghyll woodland	None present

Protected and designated species

International designations	52 species	758 records
National designations	146 species	2,588 records
Other designations	274 species	5,013 records
Total	300 species	5,442 records
Invasive non-native	31 species	162 records

The report is compiled using data held by Sussex Biodiversity Record Centre (SxBRC) at the time of the request. SxBRC does not hold comprehensive species data for all areas. Even where data are held, a lack of records for a species in a defined geographical area does not necessarily mean that the species does not occur there – the area may simply not have been surveyed.

**This summary page may be published.
The full report and maps may not be published or otherwise shared.**

The data search report is valid until 18/08/2021 for the site named above.

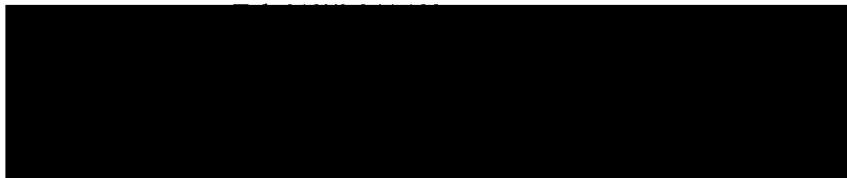
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Date: 26/08/2020

Appendix B: The Ecology Partnership Reptile Survey (2020)



Land to the south of Old
Worthing Road, East Preston

Reptile Survey Report

Contents

1.0 INTRODUCTION	3
2.0 REPTILE SURVEY METHODOLOGY	5
3.0 RESULTS.....	5
4.0 DISCUSSION AND RECOMMENDATIONS.....	6
MITIGATION STRATEGY.....	7
ENHANCEMENT STRATEGY FOR DEVELOPMENT ZONE	9
5.0 CONCLUSIONS	11
6.0 REFERENCES.....	11

LIABILITIES:

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living animals and plants are capable of migration/establishing and whilst such species may not have been located during the survey duration, their presence may be found on a site at a later date.

This report provides a snap shot of the species that were present at the time of the survey only and does not consider seasonal variation. Furthermore, where access is limited or the site supports habitats which are densely vegetated only dominant species maybe recorded.

The recommendations contained within this document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to or during works.

1.0 Introduction

Background

- 1.1 The Ecology Partnership was commissioned by Redrow Homes to undertake a presence/likely absence survey for reptiles on land to the south of Old Worthing Road, East Preston. The survey was identified as required during the Preliminary Ecological Assessment (PEA; The Ecology Partnership August 2020) for the project.
- 1.2 The site consisted of an arable field and associated uncultivated margins. The northern and western site boundaries supported tree lines. The southern site boundary bordered a railway and the western site boundary backed onto residential properties. The field margins consisted of semi-improved grassland. At the time of the survey these areas had a high sward height and supported a variety of different species.
- 1.3 The marginal semi improved grassland is still considered to offer some suitable habitat for common reptile species. As these areas may be lost through development of the site, a presence/likely absence survey for reptiles was recommended within the edges of the site in suitable habitats.
- 1.4 This report presents the results of The Ecology Partnership's survey of the site, which aims specifically to determine the current presence/likely absence of reptiles on the site.

Site Context and Status

- 1.5 The site is situated on the eastern edge of the village of East Preston in West Sussex, approximately 4 miles west of the town of Worthing (TQ 08100 03089 – site centre point). The site is approximately 5.7ha in size. The aerial photograph overleaf (Figure 1) shows the site and its immediate surroundings. The red line depicts the approximate site boundary and survey area.

Description of Proposed Development

- 1.6 It is understood that the current development proposal is for the construction of a new residential development within the site.



Photo Above: arable landscape not suitable for reptiles



Photo Above: arable site margins, with established grassland and shrub edges. These were the features which are considered suitable for reptiles.



Figure 1: Approximate location of the site, indicated by red line boundary (Image taken 18/08/2020 © 2020 Google)

2.0 Reptile Survey Methodology

- 2.1 Prior to the commencement of the reptile presence/likely absence survey the site was set up with artificial refugia (roofing felt mats) placed within suitable areas of reptile habitat, predominantly on the margins of the site on the 15th September 2020. Prior to the commencement of the survey, reptile tiles were allowed to 'bed in' for at least 5 days.
- 2.2 The timing and number of survey visits completed were based on guidelines produced by Froglife (1999) and Gent and Gibson (1998). A total of seven survey visits were made to the site to check the refugia for the presence of reptiles and to carry out a visual transect. Visits were only carried out if the weather conditions were suitable for locating reptiles and took place at a variety of times of day (some in the morning and some in the afternoon so that different mats would be exposed to the sun), in order to maximise the probability of finding reptiles if they were present.
- 2.3 Note that whilst checking the artificial refugia a visual check was also carried out of natural basking sites and refugia on the site. Natural refugia, such as log piles, were searched for evidence of reptiles, whilst the route chosen in moving between the artificial refugia allowed a thorough visual transect of the whole site to be carried out, again in accordance with Natural England guidelines.

3.0 Results

- 3.1 Table 1 below documents the timing and weather conditions of the reptile survey visits, along with the reptiles identified on site during the survey.

Table 1: Details of the surveys and finds

Visit	Date	Conditions	Finds
Set-up	16/09/2020	-	-
1	22/09/2020	Sunny, dry and still. Approx. 18°C 45% cloud cover	2 female common lizards 3 sub-adult slow worms
2	24/09/2020	Sunny, dry and breezy. Approx. 13°C 40% cloud cover	No reptiles
3	28/09/2020	Cloudy with sunny spells, dry and still. Approx. 15°C 5% cloud cover	1 adult common lizard (unknown sex) 1 adult female slow worm
4	30/09/2020	Sunny, dry and breezy. Approx. 16°C 95% cloud cover	1 adult female slow worm

5	01/10/2020	Sunny, dry and still. Approx. 14°C 20% cloud cover	1 adult common lizard (unknown sex) 2 adult female slow worms
6	06/10/2020	Overcast, dry and breezy. Approx. 15°C 50% cloud cover	1 adult female slow worm 2 sub-adult slow worms 1 juvenile slow worm
7	09/10/2020	Sunny, dry and still. Approx. 12°C 0% cloud cover	1 adult female slow worm 2 sub-adult slow worms

- 3.2 During the survey, slow worms and common lizards were identified on the margins of the fields. Across both fields, the peak counts of adult reptiles were of 2 slow worms and two common lizard. Under the still widely used Froglife (1999) scoring system (Table 2), the site is considered to support a 'low' population of slow worms and a 'low' population of common lizards.

Table 2: Population class assessment categories (Froglife 1999) and their application at the site

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

4.0 Discussion and Recommendations

- 4.1 Two species of common reptiles (slow worm and common lizard) were found to be using the site. Based on the survey findings and the scoring criteria detailed in Froglife (1999), the site has been identified as supporting a 'low' population of slow worms and a 'low' population of common lizards. As the site only supports two species of reptile and therefore does not qualify as a key reptile site.
- 4.2 The four widespread species of reptile are legally protected via part of Section 9(1) of the Wildlife and Countryside Act 1981 (as amended) against "*intentional killing and injuring*". Natural England's standing advice where widespread reptiles be effected by a development (<https://www.gov.uk/guidance/reptiles-protection-surveys-and-licences>) is that a mitigation plan will need to be produced to meet legislation. This is usually delivered through a condition on any approved development.

- 4.3 As areas of suitable reptile habitat are likely to be lost through development of the site, a mitigation strategy has to be developed to ensure that individuals are not harmed by the redevelopment of the site.

Mitigation Strategy

- 4.4 As suitable terrestrial habitat is likely to be lost as a result of development within the red-line boundary of the site, reptiles must be moved outside the development zone to ensure that individuals are not harmed by the proposals.
- 4.5 Mitigation will involve the construction of a reptile fence around the development footprint. The habitats outside the reptile fence are to be maintained and enhanced. The habitats within the fence are to be cleared of reptiles. The reptile fence will be constructed following the standard below (Figure 2).

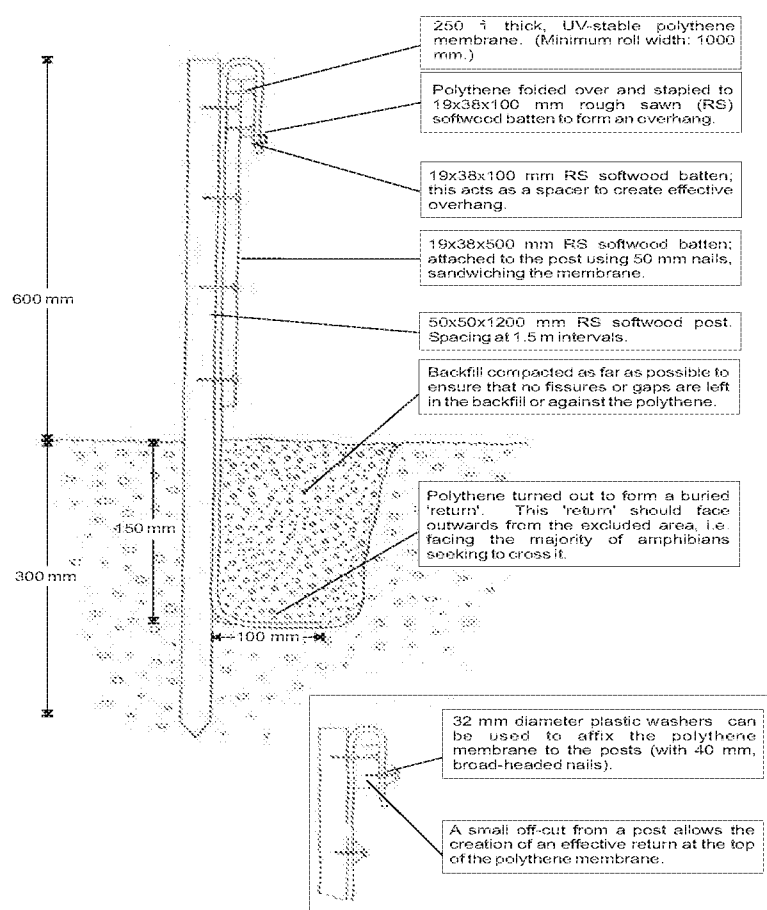


Figure 2: Fence line standards

- 4.6 With the exclusion fence set-up, the area inside can be trapped intensively for reptiles. Based on the 'Minimum Capture Effort for Common Reptile Projects' (Table 2 of the HGBI guidelines 1998) and the population of reptiles present within the site, HGBI guidelines advises that with

a density of 50 artificial refugia (tins) per hectare, a minimum of 60 reptile capture days (in good weather) may be required to clear the site, which the HGBI guidelines states demonstrates a 'reasonable effort' to remove the population(s) present from a site. Trapping will take place in optimal weather conditions, between March and October (inclusive). It is recommended that the capture effort be reviewed after 30 days, dependent on the extent of the habitat to be lost / altered as a result of the development. If reptiles are still being caught/sighted, trapping must continue until there are 5 consecutive no reptile-catch days.

- 4.7 A receptor site for the reptiles that are to be removed from the development zone needs to be determined and therefore provision may either be made within a suitable and adequately sized area of the site or reptiles may be relocated to a pre-determined off-site receptor site. This is however dependent on the scale and nature of the development proposals.
- 4.8 However, it is considered likely that it will be possible to retain reptiles on the margins of the site, so long as connectivity is maintained to additional areas of suitable on-site and off-site habitat. However, the scheme must consider and seek to maintain habitat connectivity, not only within the site, but with areas of suitable existing habitat outside of the site boundaries within the local landscape.
- 4.9 Once the trapping has been completed, or that there are 5 no catch days, the grassland will then be strimmed to 150mm, checked, and then finally strimmed down to ground level. This will be undertaken under ecological supervision. The arisings can be taken off site or placed in several compost heaps within the retained habitat, providing good habitat for breeding reptiles.
- 4.10 For the final stage of the translocation process, any natural reptile refugia will need to be dismantled by hand or using sensitive machine work under close supervision of an ecologist.
- 4.11 The mitigation strategy will therefore follow:
- Reptile fencing being placed around the edges of the site, ensuring that the area outside the development footprint is fenced off, therefore fencing off any potential movement of reptiles on to the site. This physical barrier will protect any species using the edges of the site.
 - The trapping effort will be reviewed after 30 days; however, if reptiles are still being caught/sighted, trapping will continue until there are 5 clear days of no captures during suitable weather conditions. The slow worms and common lizards will be removed from the development zone to a pre-determined receptor site. The fence-line will

prevent them moving to the construction zone.

- This area will be monitored during site works by an ecologist to ensure the fence-line is fit for purpose and that the area is respected as a 'wildlife exclusion area'.
- Once 5 clear trapping days has been gained, the grass within the development zone will be strimmed.
- Any areas which support dense vegetation should be removed sensitively under ecological supervision. The process would entail a visual inspection and fingertip search by an ecologist for the presence of reptiles. This is followed by a cut of the vegetation to 150mm above ground. This cut is inspected once more for the presence of reptiles. Finally, vegetation is cut to ground level.
- Final clearance works and sensitive soil removal will also be carried out under the supervision of an ecologist.
- Once this is complete, development works can start.

Enhancement Strategy for Development Zone

- 4.12 The treelines, hedgerows and tussocky/ scrubby site boundaries should be enhanced, and any gaps filled to create a more robust habitat edge which provides a greater level of diversity than is currently present. Hedgerows help to provide a layering of different habitats that can be utilised by a wide variety of species. Species that can be planted include blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), field maple (*Acer campestre*), holly (*Ilex aquifolium*), elder (*Sambucus nigra*), alder (*Frangula alnus*), guelder rose (*Viburnum opulus*), dog rose (*Rosa canina*) and dogwood (*Cornus sanguinea*).
- 4.13 Hedgerow and treeline edges can be planted with herbaceous plants and bulbs. These will attract bees, butterflies and other insects as well as providing ground cover for smaller animals. Seeds that are tolerant of semi-shade and are suitable for sowing beneath newly planted or established hedges should be used.
- Yarrow (*Achillea millefolium*)
 - Agrimony (*Agrimonia eupatoria*)
 - Garlic mustard (*Alliaria petiolata*)
 - Common knapweed (*Centurea nigra*)
 - Wild basil (*Clinopodium vulgare*)
 - Hedge bedstraw (*Galium album*)
 - Wood avens (*Geum urbanum*)
 - Oxeye daisy (*Leucanthemum vulgare*)

- Ribwort plantain (*Plantago lanceolata*)
- Cowslip (*Primula veris*)
- Selfheal (*Prunella vulgaris*)
- Red campion (*Silene dioica*)
- Bladder campion (*Silene vulgaris*)
- Hedge woundwort (*Stachys sylvatica*)
- Upright hedge parsley (*Torilis japonica*)
- Tufted vetch (*Vicia cracca*)

4.14 A 2m wide buffer strip, using the Emorsgate rough grassland seed mix, can be developed adjacent to retained field margin habitats to provide a buffer from the development.

4.15 At least five new log and brush piles should be created within the new receptor site. Several can also be placed under treelines and hedgerows to provide refugia and hibernacula for amphibians, reptiles, small mammals and invertebrates. Log piles should be located in a variety of locations, such as damp places, with some situated in more sunny locations. These should be stacked and some amounts of leaf litter added. Planting around log piles with such species as honeysuckle or clematis can also add value. Several of these should be added within the receptor area. Examples of log piles can be seen in Figure 3 below.

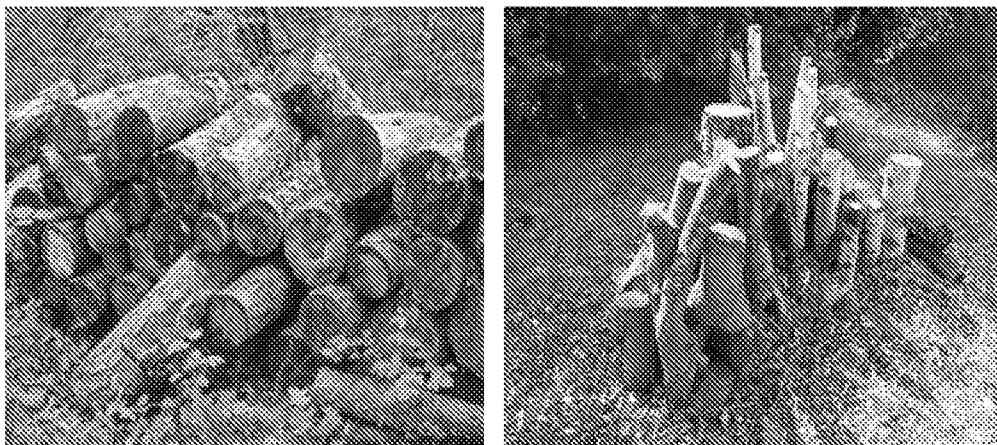


Figure 3 Pictures above showing how log pile and hibernacula can be created within receptor area on site. It is recommended that several piles are created of each type. These piles can be used by a variety of wildlife, reptiles being one group that happily use such features.

5.0 Conclusions

- 5.1 Reptile presence/likely absence surveys were undertaken within fields on site in September and October 2020. This survey identified a 'low' population of slow worms and a 'low' population of common lizards.
- 5.2 The development is likely to involve the loss of terrestrial habitat for reptiles. As such, reptiles are required to be translocated from the proposed development zone to a suitable and adequately sized, pre-determined receptor site. Provision may either be made within the site itself or reptiles may be relocated to a pre-determined off-site receptor site. This is however dependent on the scale and nature of the development proposals.
- 5.3 It is considered likely that reptiles will be able to be retained on the site margins, so long as connectivity to areas of suitable on-site and off-site habitat is maintained. The receptor site for the reptiles to be translocated will be determined and the mitigation strategy can be conditioned as part of the permission.
- 5.4 It is considered that the translocation of slow worms and common lizards would ensure that none are harmed by the development.
- 5.5 General site enhancements have also been recommended to provide new opportunities for a range of wildlife post-development. Greenspaces within the development area should incorporate habitats and features making them suitable for reptiles and other wildlife, all to be managed in a way that will sustain their wildlife value.

6.0 References

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

Gent, T. & Gibson, S. eds. (1998) *Herpetofauna Workers Manual*. Joint Nature Conservation Committee, Peterborough.

Herpetofauna Groups of Britain and Ireland (1998) *Evaluating local mitigation/translocation programmes: maintaining best practice and lawful standards*. HGBI advisory notes for local reptile groups (ARGs).

Google Earth: www.earth.google.co.uk

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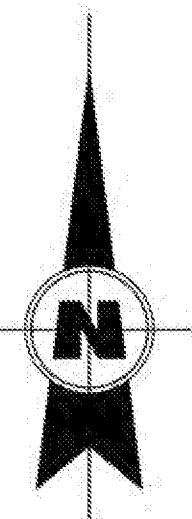
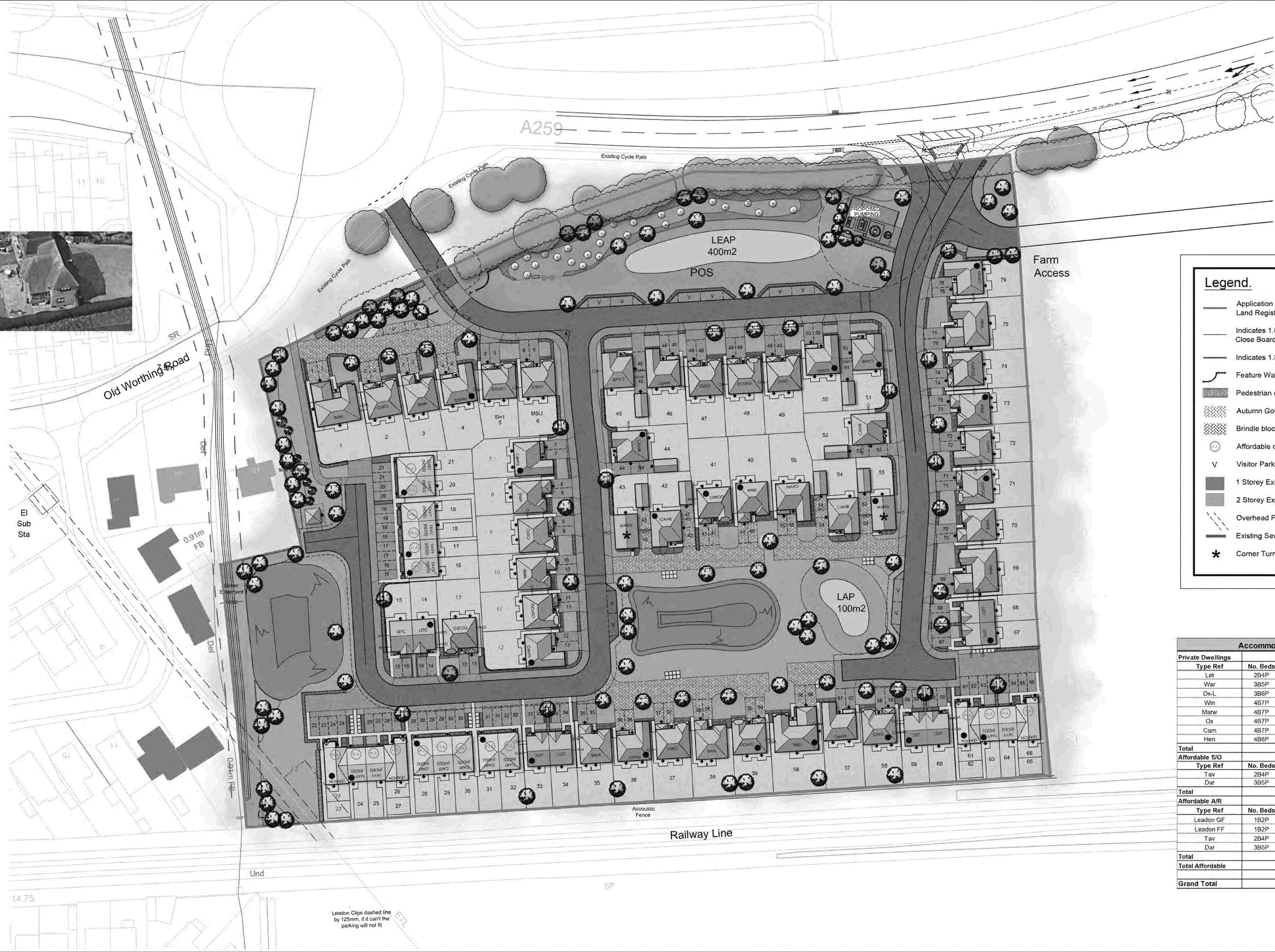
KT22 8JB



Approved: Alexia Tamblyn MA (Oxon) MSc CENv MCIEEM FRGS

Date: 18/10/2020

Appendix C: Development proposals



Legend

- Application Boundary - to be verified by Land Registry / Client
- Indicates 1.8m high Close Boarded Fencing
- Indicates 1.8m high Screen Wall
- Feature Wall
- Pedestrian crossing points
- Autumn Gold block pavings
- Brindle block pavings
- Affordable dwellings
- Visitor Parking Space
- 1 Storey Existing Dwelling
- 2 Storey Existing Dwelling
- Overhead Powerlines
- Existing Sewer
- Corner Turner with additional window

Accommodation Schedule

Private Dwellings				
Type Ref	No. Beds	Sqft	No. Units	Total Sqft
Let	2B4P	984	8	7872
War	3B5P	1081	2	2162
Ox-L	3B6P	1318	8	10544
Win	4B7P	1240	8	9920
Marw	4B7P	1289	10	12890
Ox	4B7P	1318	7	9226
Cam	4B7P	1394	6	8364
Hen	4B8P	1769	4	7076
Total			53	68054
Affordable S/O				
Type Ref	No. Beds	Sqft	No. Units	Total Sqft
Tav	2B4P	865	4	3460
Dar	3B5P	1014	2	2028
Total			6	5488
Affordable A/R				
Type Ref	No. Beds	Sqft	No. Units	Total Sqft
Leadon GF	1B2P	506	4	2024
Leadon FF	1B2P	641	4	2564
Tav	2B4P	865	4	3460
Dar	3B5P	1014	5	5070
Total			17	13118
Total Affordable			23	18606
Grand Total			76	86660

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided. This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert. Where existing trees are to be retained they should be subject to a full Arboricultural Inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation is to be provided to accommodate the proposed tree planting. Geoff Perry Associates Limited do not accept any responsibility for any losses (financial or otherwise) to any Client or third party arising out of the Clients (be it Developer or Contractor but not limited thereto) non-compliance with above mentioned provisions.

Revisions:

- A. Plot subdivision. Pump station added in south west corner, visitor parking added: 19/10/20 BPC/CP/1725 revised.
- B. Additional F103 1.2m in south west corner: 22/11/20 BPC.
- C. Plot 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 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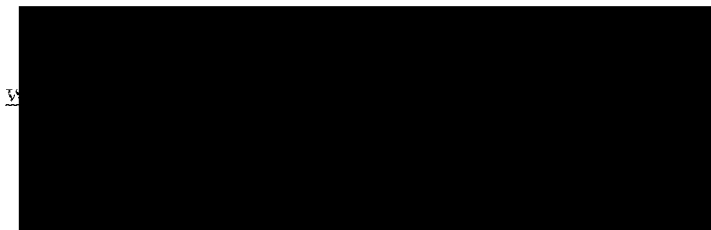
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Date: 06/07/2021