

**WOODGATE CENTRE, WESTERGATE,
WEST SUSSEX**

ECOLOGICAL IMPACT ASSESSMENT

Final Document (Revision 1)

October 2021

Preliminary Ecological Appraisals • Protected Species Surveys and Licensing • NVC • EcIA • HRA • Management Plans
Habitats • Badger • Bats • Hazel Dormouse • Birds • Reptiles • Amphibians • Invertebrates • Riparian and Aquatic Species

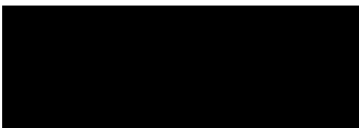
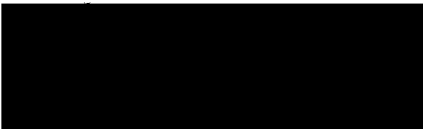
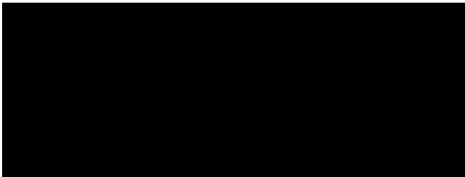
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**WOODGATE CENTRE, WESTERGATE,
WEST SUSSEX**

ECOLOGICAL IMPACT ASSESSMENT

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EXECUTIVE SUMMARY

Ecological Survey and Assessment Ltd (ECOSA) have been appointed by Pye Homes to undertake an Ecological Impact Assessment to support a planning application for the redevelopment of the Woodgate Centre, Westergate. The site is located in Westergate, West Sussex and comprises a series of industrial and residential buildings surrounded by horse-grazed paddocks. The proposals entail the redevelopment of the site for 180 residential units. The main findings of the assessment are:

- The site supports a low status day roost of soprano pipistrelle within one of the buildings and provides suitable habitat for foraging and commuting bats, badger, nesting birds, reptiles, invertebrates and European hedgehog. The Lidsey Rife supports a low population density of water vole.
- Adverse impacts on these ecological features have been identified and mitigation and compensation measures determined. Mitigation measures will include the use of tree protection barriers, implementation of a CEMP, sensitive working methods of timings of work in relation to bats, birds and reptiles, while compensatory planting will replace habitat areas lost to the development.
- Enhancement measures will be implemented in relation to bats through the installation of additional bat roosting features in new buildings and bat boxes in trees; for birds through the provision of artificial nest boxes suitable for swallows and house sparrow and a range of other bird species, and creation of new landscaping, areas of grassland, tree and hedgerow planting.
- Given the impacts identified, and the mitigation, compensation and enhancement measures proposed, it is considered that the proposals accord with all relevant local and national planning policy.
- If the planning application boundary changes or the proposals for the site alter, a re-assessment of the scheme in relation to ecology may be required. Given the mobility of animals and the potential for colonisation of the site over time, updating survey work may be required, particularly if development does not commence within 18 months of the date of the most recent relevant survey.

1.0 INTRODUCTION

1.1 Background

Ecological Survey & Assessment Limited (ECOSA) have been appointed by Pye Homes to produce an Interim Ecological Assessment Report to support a planning application for the redevelopment of the Woodgate Centre, Westergate, West Sussex, PO20 3SX (hereafter referred to as the site).

ECOSA undertook a Preliminary Ecological Appraisal of the site in 2017 (ECOSA, 2017). During the appraisal, the site and boundary habitats were found to have suitability for supporting bats (roosting within buildings/mature trees and foraging/commuting within the site), reptiles, nesting birds, badger, hazel dormouse, otter, water vole and hedgehog. As such, a range of further species-specific surveys were recommended and undertaken at the site. A previous Interim Ecological Assessment report was produced providing the methodology, survey results as of 2018 and outline recommendations for avoiding potential impacts along with possible mitigation, compensation and enhancement measures in 2020 (ECOSA, 2020).

Following this, an updating walkover survey was undertaken in October 2020 to confirm whether there had been any material change in the habitats present since the previous survey works were undertaken, and an Ecological Impact Assessment report produced (ECOSA, 2021). The purpose of this report was to support a pre-application advice submission in relation to the development site.

While no material change to the site was recorded during the updating walkover survey, some of the species-specific survey data presented within the 2021 Ecological Impact Assessment (ECOSA, 2021) was up to three years old. As such, Pye Homes commissioned ECOSA to update these surveys during the 2021 surveys season. The purpose of this report is to support a full planning application for the development site, submitted this year.

1.2 The Site

The site is located in Westergate, West Sussex, centred on National Grid Reference (NGR) SU 9412 0410 (**Map 1**). The Phase 1 habitat map (**Map 2**) depicts the boundary of the site.

The site covers 7.25 hectares and is situated within a semi-rural setting. The site comprises a series of agricultural, industrial and residential buildings surrounded by horse-grazed fields.

The site is located south of the Chichester to Barnham railway line, east of an area of residential housing off Woodgate Close. Agricultural land is present to the north, south

and east of the site, intersected by mature hedgerows and treelines. A watercourse, the Lidsey Rife, forms the eastern site boundary.

1.3 Aims and Scope of Report

The information within this report is based on a field survey and desktop study and relevant species-specific surveys carried out between May 2017 and October 2021. The report describes the habitats and species (hereafter referred to as ecological features) within the site's Zone of Influence (Paragraph 3.2) and provides a detailed assessment of potential ecological effects of the proposed development of the site. It outlines measures to avoid, mitigate or compensate for significant adverse effects¹ on habitats and species and outlines enhancements to the site's ecology which could be implemented as part of the development. The objectives of the assessment are:

- To provide baseline information on ecological features within the site's Zone of Influence and determine the importance of these features;
- To assess, characterise and quantify the effects on ecological features, including cumulative effects, and identify significant effects in the absence of any mitigation;
- To set out measures to avoid, mitigate and compensate for significant ecological effects in accordance with the 'mitigation hierarchy'²;
- To provide an assessment of the significance of any residual effects;
- To outline opportunities for enhancement in order to achieve a net gain for biodiversity; and
- To set out the requirements for any post-construction monitoring.

1.4 Site Proposals

The proposals are for the redevelopment of the site for a residential scheme comprising 180 units with associated gardens, car parking and amenity space. A new lighting scheme will also form part of the proposals.

The Interim Ecological Assessment is based on the proposals plan 'Site Layout' produced by ECE Architecture, dated March 2021 (Drawing No. 6781-02 Revision M) (Appendix 1).

¹ For the purposes of this assessment a 'significant' adverse effect is one which will have an adverse effect on the ecological feature at the site level or higher.

² In accordance with CIEEM Ecological Impact Assessment guidance (CIEEM, 2018) a sequential process is adopted to address impacts on features of ecological interest, with 'Avoidance' prioritised at the top of the hierarchy and Compensation/Enhancement' at the bottom. This is often referred to as the 'mitigation hierarchy'.

2.0 PLANNING POLICY CONTEXT

2.1 Introduction

This section summarises the planning policy in relation to ecology and biodiversity within the Arun District Council administrative area. This information is then used to assess the compliance of the scheme in relation to relevant planning policy and where necessary make recommendations for mitigation, compensation and enhancements (see Section 5.0).

2.2 National Policy

The National Planning Policy Framework (NPPF) sets out the government's requirements for the planning system in England. The original document was published in 2012 with the revised NPPF published in February 2019. A number of sections of the NPPF are relevant when taking into account development proposals and the environment. As set out within Paragraph 11 of the NPPF *"Plans and decisions should apply a presumption in favour of sustainable development"*. However, Paragraph 177 goes on to state that *"The presumption in favour of sustainable development does not apply where development requiring appropriate assessment because of its potential impact on a habitats site³ is being planned or determined"*.

The general impetus of the NPPF in relation to ecology and biodiversity is for development proposals to not only minimise the impacts on biodiversity but also to provide enhancement. Paragraph 170 states that the planning system should contribute to and enhance the natural environment by *"...minimising impacts on biodiversity and providing net gains in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures..."*.

A number of principles are set out in Paragraph 175, including that where harm cannot be adequately avoided then it should be mitigated for, or as a last resort, compensated for. Where impacts occur on nationally designated sites, the benefits must clearly outweigh any adverse impact and incorporating biodiversity in and around developments should be encouraged. Specific reference is also made to the protection of irreplaceable habitats⁴. Where loss to irreplaceable habitats occur planning permission would normally be refused unless there are wholly exceptional reasons and an adequate compensation strategy is in place. Paragraph 175 also states *"development whose primary objective is to conserve or enhance biodiversity should*

³ The NPPF defines a habitats site as *"Any site which would be included within the definition at regulation 8 of the Conservation of Habitats and Species Regulations 2017 for the purpose of those regulations, including candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation, Special Protection Areas and any relevant Marine Sites."*

⁴ The NPPF defines irreplaceable habitats as *"Habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. They include ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen."*

be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity". Protection of sites proposed as Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites or acting as compensation for SPAs, SACs and Ramsar sites, should receive the same protection as habitat sites.

In addition to the NPPF, Circular 06/05 provides guidance on the application of the law relating to planning and nature conservation as it applies in England. Paragraph 98 states *"the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat"*. Whilst paragraph 99 states *"it is essential that the presence or otherwise of a protected species, and the extent that they may be affected by the proposed development, is established before planning permission is granted"*.

2.3 Local Policy

Local planning policy within Arun District is provided by the saved policies within the Arun District Local Plan 2011-2031. The policies relevant to ecology are summarised below:

- **Policy ENV SP1: Natural Environment**

This policy states that developments must consider the following designated sites within their proposals: Pagham Harbour Ramsar site, Special Protection Area (SPA) and Sites of Special Scientific Interest (SSSI), Arun Valley Special Area of Conservation (SAC) and SPA, Solent and Dorset Coast Potential SPA (pSPA), Bognor Reef SSSI, Felpham SSSI and Climping Beach SSSI.

- **Policy ENV DM1: Designated Sites of Biodiversity or Geological Importance**

This policy states that proposed development likely to have adverse effects on the designated sites mentioned above, will not normally be permitted, unless:

- There is no alternative solution;
- There are reasons of public health or public safety;
- There are benefits of primary importance to the environment; or
- There are imperative reasons of overriding public interest.

- **Policy ENV DM2: Pagham Harbour**

This policy states that development within 0-400 metres of Pagham Harbour will only be permitted in exceptional circumstances where the developer is able to demonstrate there will be no detrimental effects. New residential development

within 0-5 kilometres of Pagham Harbour will be required to make developer contributions towards the agreed strategic approach, and/or create easily accessible new green spaces for recreation.

- **Policy ENV DM3: Biodiversity Opportunity Areas**

This policy states that development shall retain and sympathetically incorporate locally valued and important habitats, including wildlife corridors and stepping stones, and be designed in order to minimise disturbance to habitats. Where a development scheme would result in habitat loss, mitigation measures will be proposed and agreed with the LPA prior to determination of any planning application.

- **Policy ENV DM5: Development and Biodiversity**

This policy states that development schemes shall, in the first instance, seek to achieve a net gain in diversity and protect existing habitats. They shall also incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features. Where there is evidence of a protected species, planning applications shall include detailed survey work and consideration of potential impacts.

While the site does not lie within the South Downs National Park, a single policy within the South Downs National Park Local Plan (2014-33) is relevant to this site. This is Strategic Policy SD10: International Sites. This policy states that development proposals should have due regard to the possibility that Barbastelle *Barbastella barbastellus* and Bechstein's bat *Myotis bechsteinii* may utilise a site for foraging and commuting if it lies within 12 kilometres of the Mens SAC, Ebernoe Common SAC and the Singleton and Cocking Tunnels SAC. The site lies over 12 kilometres from the Mens SAC and the Ebernoe SAC, but is located 11.9 kilometres south-east of the Singleton and Cocking Tunnels SAC.

3.0 METHODS

3.1 Introduction

This section details the methods employed during the Ecological Impact Assessment. Any significant limitations to the desk study/survey methods are also considered.

3.2 Zone of Influence

To define the total extent of the study area for this assessment, the proposed scheme was reviewed to establish the spatial scale at which ecological features could be affected⁵. The appropriate survey radii for the various elements of the assessment (i.e. desktop study, field surveys and species-specific surveys) have been defined in the relevant sections below. These distances are determined based on the professional judgement of the ecologist leading the appraisal, taking into account the characteristics of the site subject to assessment, its surroundings and the nature of the proposals.

3.3 Scoping

Protected species considered within this appraisal are those species/species groups considered likely to be encountered given the geographical location and context of the site. Where the site was found to be suitable to support these species/species groups, and adverse effects cannot be avoided from the outset, further species-specific surveys are undertaken. These are discussed within the results section (Section 4.0) of the current report. Where such a species is unlikely to be present on site a justification for likely absence is provided. Species considered likely absent from the site are not then considered in the assessment of ecological effects and mitigation/compensation measures section (Section 5.0) of this report.

3.4 Desk Study

3.4.1 *Biological Records Centre*

Sussex Biodiversity Records Centre (SxBRC) was consulted on 16th May 2017. Due to the amount of time that has elapsed since obtaining this BRC data, a new data request was submitted on 7th April 2021 for the following data:

- Records of non-statutory designated sites (Local Wildlife Sites (LWSs) within one kilometre of the site boundary. See **Appendix 2** for details; and
- Records of legally protected and notable species (flora and fauna) within 500 metres of the site boundary, including Species of Principal Importance (**Appendix 3**); and

⁵ The Zone of Influence (Zoi), as defined by CIEEM, is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities (CIEEM, 2018).

- Records of bats within two kilometres of the site boundary. Bat species are highly mobile and therefore the search radius is increased for this species group; and
- Records of birds within one kilometre of the site boundary.

3.4.2 Multi-Agency Geographic Information for the Countryside

The Multi-Agency Geographic Information for the Countryside (MAGIC) database (DEFRA, 2020) was reviewed on 28th June 2021 to establish the location of statutory designated sites located within the vicinity of the site. This included a search for all internationally and nationally designated sites such as SPAs, SACs, Ramsar sites, SSSIs, National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) within five kilometres of the site. See **Appendix 2** for details. Where appropriate, the desk study search area has been extended to take account of any appropriate statutory designated sites which need consideration in terms of potential in-direct effects and which support particularly mobile species, particularly those specifically mentioned in local planning policy. The Impact Risk Zones (IRZ) were also obtained from MAGIC, which are used to help guide and assess planning applications for likely effects on SSSIs.

Sites within two kilometres of the site boundary where European Protected Species Mitigation (EPSM) licences have been granted were reviewed. This information allows a greater understanding of the potential for European protected species to be present in the local area.

3.4.3 Other Sources of Information

Online mapping resources, at an appropriate scale, were used to identify the presence of habitats such as woodland blocks, ponds, watercourses and hedgerows, in the vicinity of the site. These habitats may offer resources and connectivity between the site and suitable habitat in the local area, which may be exploited by local species populations.

The presence of ponds or other waterbodies within a 500 metre radius of the site in particular are noted in relation to great crested newt. The 500 metre radius is a standardised search radius to assist in the assessment of the suitability of a site and its surrounding habitat to support this species, based on current Natural England guidance (English Nature, 2001).

3.5 Field Survey

3.5.1 Survey Methods

The field survey and updating walkover survey broadly followed standard Phase 1 habitat survey methodology (JNCC, 2010) and included a search for evidence of, and

an assessment of the site's suitability to support, protected and notable species as recommended by CIEEM (CIEEM, 2018). The field survey and updating walkover survey covered all accessible areas of the site, including boundary features. Habitats described in Section 4.0, have been mapped (**Map 2**) and photographs provided, where relevant. For ease of reference, Target Notes (TN) depict locations of particular ecological interest or features which are too small to map.

Phase 1 Habitat Survey

An assessment was made of all areas of vegetation within the site based on the standardised Phase 1 habitat survey methodology (JNCC, 2010)⁶. This involved identification of broad vegetation types, which were then classified against Phase 1 habitat types, where appropriate. A list of characteristic plant species for each vegetation type was compiled and any invasive species⁷ encountered as an incidental result of the survey recorded.

Protected and Notable Species Appraisal

A preliminary appraisal of the site's suitability to support legally protected and notable species was carried out. Specific methods for species/species groups considered during the appraisal are provided in **Appendix 4**.

3.5.2 Survey Details

The initial field survey was carried out by Samantha Munslow, Principal Ecologist of ECOSA on 22nd May 2017. The weather conditions were dry with approximately 40% cloud cover, an ambient temperature of 18°C and a light breeze.

The updating walkover survey was carried out by Helen Butt, Ecologist of ECOSA on 6th October 2020. The weather conditions were dry with approximately 60% cloud cover, an ambient temperature of 13°C and a moderate wind.

During both surveys, the surveyor was equipped with a ladder, 10x40 binoculars, a high-powered torch and a digital camera.

3.5.3 Field Survey Limitations

Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. The field survey has therefore not produced a complete list of plants and animals and in the absence of

⁶ The standard JNCC Phase 1 habitat survey methodology involves the production of a Phase 1 map showing the location and extent of habitat types, however, given the limited size and complexity of the site surveyed a Phase 1 habitat map has not been produced in this instance.

⁷ Plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). The survey was not specifically aimed at assessing the presence of these species and further specialist advice may need to be sought.

evidence of any particular species should not be taken as conclusive proof that the species is absent or that it will not occur in the future.

Online mapping resources provide an indication of habitat features present in the wider area, but do not provide a detailed assessment of habitat types.

Not all potential bat roosting features are accessible to the surveyor, e.g. gaps beneath roof materials or holes or cracks in trees, and therefore assessments are based upon the potential for these features to provide suitable roosting opportunities.

During the initial field survey in 2017, internal access was not possible for all of the on-site buildings, however, buildings which were not internally inspected do not contain cellars/roof voids and are in regular use and therefore this lack of access is not considered to be a significant constraint to the assessment.

Subsequently, no internal access was possible to any of the buildings during the 2020 updating walkover survey due to ECOSA's Health and Safety Policy regarding the COVID 19 pandemic, where occupied buildings or buildings in regular use were not be entered.

It is not always possible to provide definitive assessments of a species' presence/likely absence at a site and so in the absence of direct evidence, assessments and recommendations are based on the presence of suitable habitat within/adjacent to a site and the results of species records within the desk study data.

3.6 Bat Survey

3.6.1 Survey Methods

Ground Level Tree Assessment

The Ground Level Tree Assessment was undertaken in line with current best practice guidelines (Collins, 2016). An assessment was made of the suitability of the trees on the site and immediately on the site boundary (**Map 3**) to support roosting bats based on the presence of Potential Roost Features such as holes, cracks, splits, loose bark and ivy cladding. The assessment of the potential for trees on the site to support roosting bats is based on a four-point scale as detailed in **Appendix 5**.

Bat Tree Climb and Inspect Survey

The Bat Tree Climb and Inspect survey was undertaken in line with current best practice guidelines (Collins, 2016). Following the completion of the ground level tree assessment those trees with suitability to support roosting bats (**Map 3**) were subject to tree climb and inspect surveys in order to provide a detailed assessment of the suitability of Potential Roost Features to support roosting bats.

The climb and inspect survey involved the use of rope access techniques to climb those trees assessed as having suitability to support roosting bats from the ground level and ascertain whether Potential Roost Features previously identified on the trees were suitable for bat roosting.

The tree climb and inspect survey then allowed surveyors to either confirm presence of a roost through the presence of bat roosting evidence such as droppings or staining or rule out features which otherwise may have appeared suitable from the ground level tree assessment.

Where bat roosts are identified or confirming likely absence of bat roosts within suitable features is not possible, further emergence/re-entry surveys were carried out.

Bat Emergence/Re-entry Survey

The bat emergence/re-entry surveys of all relevant on-site buildings and trees were undertaken in line with current best practice guidelines (Collins, 2016) between August 2017 and October 2018 and between July and September 2021. In accordance with guidelines for buildings/trees assessed as having suitability to support roosting bats, a single dusk emergence survey was undertaken for buildings with low suitability to support roosting bats, a dusk emergence survey and a dawn re-entry survey were undertaken for buildings/trees assessed as having moderate suitability for roosting bats and two dusk emergence surveys and a dawn re-entry survey were undertaken for buildings/trees with high suitability to support roosting bats, were undertaken in order to ascertain the presence/likely absence of roosting bats from within the buildings/trees. Where the presence of roosting bats is confirmed, the data also allows for an assessment of the status of the roost present. The status of roosts (where appropriate) has been based on standard terminology as detailed in **Appendix 6**. Low suitability trees were not subjected to any further survey, as per best practice guidance.

The dusk emergence surveys commenced approximately 15 minutes before sunset until approximately two hours after sunset. The dawn re-entry surveys commenced approximately two hours before sunrise until just after sunrise.

The surveys were carried out by experienced ECOSA surveyors, positioned at previously identified vantage points around the buildings/trees (**Map 4**). These vantage point locations allowed a sufficient coverage of the Potential Roosting Features identified on the buildings/trees likely to be impacted by the proposals.

During the surveys, surveyors recorded the time, species, location and direction of flight for each bat encountered, with particular attention paid to establishing bat access/egress locations to any roosts within the buildings/trees.

Bat Transect Survey

Bat transect surveys were undertaken in line with current best practice guidelines (Collins, 2016). Given that the site has been assessed as having moderate suitability for supporting foraging and commuting bats, a single survey visit was undertaken on a monthly basis between August and October 2017 (two visits in October – one at the start of the month and one at the end of the month), between April and June 2018 and between April and October 2021. This was to allow an assessment of the status and importance of foraging/commuting bats at the site to be made.

A team of two surveyors walked a pre-determined transect route across the site on each occasion (**Map 5**). The transect route was amended slightly during the 2021 survey season due to minor changes in fencing locations and presence of horses in fields. However, on all occasion, the transect route ensured that the surveyors visited key areas of foraging and commuting habitat within the site, such as hedgerows and trees as well as less suitable habitats. The dusk transect surveys commenced at sunset and lasted for at least two hours depending on the level of bat activity recorded.

The 2017/2018 transect surveys were punctuated by regular point counts, during which the surveyors stopped walking for a period of five minutes to record bat activity at that point. Point count locations were situated at key habitat features on site. The point count locations were the same on each survey. The surveyors were equipped with Pettersson D240x time expansion bat detectors. The Pettersson detectors were connected to Edirol R-90 recorders for the full duration of the survey. Recordings made with the detectors were later analysed using Sonobat® (v2.9.7) to confirm the identity of any species encountered.

For the 2021 transect surveys, the route was split into equal sections and was walked at a steady speed so that the activity levels on each section and from each survey are comparable. The surveyors were equipped with a Batlogger M detector. At the end of each transect survey, data was downloaded and then analysed using BatExplorer (Version 2.0). This program is designed to analyse bat call data by identifying key call characteristics such as call shape, call length, call 'distance' (i.e. the time period between two consecutive calls) and peak frequency. The species calls were subsequently checked manually by a suitably qualified ecologist using the spectrogram feature of BatExplorer to verify their identities. Where suitable recordings were obtained, bats were identified to species level. For some groups, notably long-eared bat species and *Myotis* bat species, specific identification was not always possible.

The GPS feature shows the location of the surveyor when the registration was recorded, not the location of the bat. Where bats were heard but not seen it has been

assumed that they are flying in the vicinity of the surveyor. Where bats were seen some distance from the surveyor the locations of these bats were noted.

Bat Automated Detector Survey

In addition to the transect surveys, automated detector surveys were undertaken in line with current best practice guidelines (Collins, 2016) between August and October 2017, between April and August 2018 and between April and October 2021.

Two Wildlife Acoustics Song Meter 2 (SM2+) detectors with SMX-U1 microphones were deployed at the site for five consecutive nights on each occasion.

The automated detectors were secured in suitable habitat with the microphone positioned to face towards the nearest open space. The devices were programmed to record between 30 minutes before sunset, until 30 minutes after sunrise the following morning on each night they were deployed. The settings utilised on the automated detectors across all survey seasons are provided in **Appendix 7**. The locations at which the automated detectors were deployed are provided in **Map 5**.

At the end of each automated survey period, the automated bat detectors were retrieved from the site, data was downloaded and then analysed using Kaleidoscope Pro® (Version 3.1.4B). This program is designed to analyse large volumes of bat call data using an automated classifier (Bats of United Kingdom Version 3.1.3). More information on the settings used for the conversion process are provided in **Appendix 7**.

The species calls were subsequently checked manually by a suitably qualified ecologist using the Kaleidoscope software, to verify their identities. Sonobat® (v2.9.7) was used to confirm the species identity for ambiguous bat calls. Where suitable recordings were obtained, bats were identified to species level. For some groups, notably long-eared bat species and *Myotis* bat species, specific identification was not always possible.

The data was then exported to Microsoft Excel for detailed analysis (i.e. counts of bat registrations) of various parameters.

The number of registrations recorded is not a measure of the number of bats present on site; the number of registrations provides a quantitative assessment of the level of bat activity at a particular location (i.e. the greater the number of registrations, the greater the level of bat activity). The data cannot differentiate between, for example, a single bat passing the detector 10 times or 10 bats passing the detector on a single occasion. The detectors were programmed to count each two second call as a single bat pass.

In order to standardise the number of bat calls recorded the data was then used to calculate an “Activity Index” for various different parameters to be assessed. This involved dividing the number of registrations by the number of nights which detectors were deployed. This data is then represented as number of registrations per night.

3.6.2 Survey Details

Ground Level Tree Assessment

The ground level tree assessment was carried out by Brian Hicks (Natural England Bat Licence 2015-14880-CLS-CLS) on 11th July 2018. The weather conditions were sunny and warm with 0-25% cloud cover, an ambient temperature of 25°C and a light breeze.

Bat Tree Climb and Inspect Survey

The climb and inspect survey was carried out by qualified tree climbers and licenced bat surveyors Ed Venables (Natural England Bat Licence 2015-14865-CLS-CLS) and Brian Hicks (Natural England Bat Licence 2015-14880-CLS-CLS) of ECOSA on 20th August 2018. The weather conditions were cloudy with sunny intervals with 25-50% cloud cover, an ambient temperature of 24°C and a light breeze.

During the surveys, the trees were accessed using climbing ropes and the surveyors were equipped with high powered torches and endoscopes.

Bat Emergence/Re-entry Survey

The bat emergence/re-entry surveys were undertaken between August 2017 and October 2018 and in July and September 2021. Building and tree locations are shown on **Map 4**. **Table 1** provides details of each emergence/re-entry survey.

Table 1: Bat emergence/re-entry survey details

Survey Date	Building/ Tree No.	Survey Type	Duration	Weather Conditions	Sunset/ Sunrise Time
29 th August 2017	B3	Dusk	19:39 – 21:54	General conditions: dry, cloudy and warm Start temp: 24°C End temp: 20.2°C Cloud Cover: 90% Wind Speed: WF1	21:54
4 th September 2017	B4	Dusk	19:25 – 21:10	General conditions: overcast Start temp: 17.5°C End temp: 17.3°C Cloud Cover: 100% Wind Speed: WF1	19:40

Survey Date	Building/ Tree No.	Survey Type	Duration	Weather Conditions	Sunset/ Sunrise Time
5 th September 2017	B6, B7, B8	Dusk	19:24 – 21:39	General conditions: dry and cloudy Start temp: 17.9°C End temp: 17.4°C Cloud Cover: 60-100% Wind Speed: WF1-3	19:39
6 th September 2017	B1, B5	Dusk	19:22 – 21:00	General conditions: dry, calm, clear and warm Start temp: 16.7°C End temp: 12.9°C Cloud Cover: none Wind Speed: WF0	19:37
19 th September 2017	B3	Dusk	18:50 – 20:45	General conditions: clear Start temp: 20°C End temp: 10°C Cloud Cover: 10% Wind Speed: No wind	19:06
21 st September 2017	B4	Dawn	04:48 – 07:03	General conditions: warm with a breeze Start temp: 15°C End temp: 14°C Cloud Cover: 5-40% Wind Speed: WF2-3	06:48
22 nd May 2018	B2	Dusk	20:40 – 22:55	General conditions: dry and clear Start temp: 20°C End temp: 14.3°C Cloud Cover: none Wind Speed: WF2	20:55
1 st June 2018	B3, B8	Dawn	02:55 – 05:10	General conditions: dry and misty, light drizzle Start temp: 15°C End temp: 13.8°C Cloud Cover: 100% Wind Speed: WF1	04:55
24 th September 2018	T3	Dusk	18:42 – 20:27	General conditions: dry and cool Start temp: 15.5°C End temp: 6.2°C Cloud Cover: 10-15% Wind Speed: WF1	18:57
8 th October 2018	T3	Dusk	18:15 – 20:26	General conditions: fair Start temp: 13°C End temp: 12°C Cloud Cover: 100% Wind Speed: WF2	18:26
21 st July 2021	B3, B4	Dusk	20:52 – 22:37	General conditions: Dry Start temp: 23°C End temp: 21°C Cloud Cover: 50-70% Wind Speed: No wind	21:07
4 th August 2021	B3, B4	Dawn	03:30 – 05:51	General conditions: Dry Start temp: 15°C End temp: 16°C Cloud Cover: 60-90% Wind Speed: No wind	05:36

Survey Date	Building/ Tree No.	Survey Type	Duration	Weather Conditions	Sunset/ Sunrise Time
20 th August 2021	B1, B2, B5	Dusk	20:02 – 22:17	General conditions: Dry Start temp: 18°C End temp: 15.8°C Cloud Cover: 75-90% Wind Speed: No wind	20:17
24 th August 2021	B6, B8	Dusk	19:53 – 22:02	General conditions: Dry Start temp: 19°C End temp: 17°C Cloud Cover: no cloud Wind Speed: WF1	20:08
20 th September 2021	B3, B7, B8	Dusk	18:53 – 21:08	General conditions: Dry Start temp: 17°C End temp: 15°C Cloud Cover: 0-60% Wind Speed: WF1	19:08

During the bat emergence/re-entry surveys, the surveyors were equipped with Pettersson D240x time expansion bat detectors. The Pettersson detectors were connected to Edirol R-05 recorders for the full duration of the survey. Recordings made with the detectors were later analysed using Sonobat® (v2.9.7) to confirm the identity of any species encountered.

The bat emergence/re-entry surveys were coordinated by Samantha Munslow, Principal Ecologist of ECOSA (Natural England Bat Licence 2015-16434-CLS-CLS) and Helen Butt, Ecologist of ECOSA (Natural England Bat Licence No. 2020-50848-CLS-CLS) assisted by suitably qualified and experienced ECOSA surveyors.

Bat Transect Survey

The bat transect surveys were undertaken between August and October 2017, between April and June 2018 and between April and October 2021. **Table 2** provides details of each transect survey.

Table 2: Bat transect survey details

Survey Date	Survey Type	Duration	Weather Conditions	Sunset/ Sunrise Time
22 nd August 2017	Dusk	20:09 – 22:09	20-19°C, dry at the start then rain at the end, 60-90% cloud cover and a light wind	20:09
19 th September 2017	Dusk	19:00 – 21:06	10-8°C, dry and clear, 5% cloud cover and no wind	19:06
5 th October 2017	Dusk	18:32 – 20:34	14-13°C, dry and clear, 15-10% cloud cover and a light breeze	18:32

Survey Date	Survey Type	Duration	Weather Conditions	Sunset/ Sunrise Time
23 rd October 2017	Dusk	17:57 – 19:57	15°C, overcast and mild, 100% cloud cover and a light wind	17:57
26 th April 2018	Dusk	20:20 – 22:20	9-8°C, overcast, 60-100% cloud cover and a light breeze	20:15
21 st May 2018	Dusk	20:53 – 22:53	15-14°C, dry and overcast, 80-50% cloud cover and no wind	20:53
18 th June 2018	Dusk	21:23 – 23:23	17°C, overcast and windy, 100-90% cloud cover and a light wind	21:23
26 th April 2021	Dusk	20:16 – 22:16	11-7°C, dry, 25-50% cloud cover and a gentle breeze	20:16
25 th May 2021	Dusk	21:02 – 23:02	12-11°C, light rain at the start, then dry, 100% cloud cover and a gentle breeze	21:02
23 rd June 2021	Dusk	21:24 – 23:24	18-12°C, dry, 10% cloud cover and a gentle breeze	21:24
19 th /20 th July 2021	Dusk/ Dawn	21:11 – 23:11 03:15 – 05:15	23-20°C, dry, no cloud cover and a gentle breeze 24-17°C, dry, no cloud cover and no wind	21:11 05:15
25 th August 2021	Dusk	20:06 – 22:06	19-16°C, dry, 0-15% cloud cover and a gentle breeze	20:06
20 th September 2021	Dusk	21:02 – 23:02	12-11°C, light rain at the start then dry, 100% cloud cover and a gentle breeze	21:02
13 th October 2021	Dusk	18:17 – 20:15	15-14°C, dry, 60-80% cloud cover and a gentle breeze	18:17

The bat transect surveys were coordinated and led by Samantha Munslow, Principal Ecologist of ECOSA (Natural England Bat Licence No. 2015-16434-CLS-CLS) and Helen Butt, Ecologist of ECOSA (Natural England Bat Licence No. 2020-50848-CLS-CLS), assisted by suitably qualified and experienced ECOSA surveyors.

The detector programming and data analysis was conducted by Helen Butt, Ecologist of ECOSA.

Bat Automated Detector Survey

The automated detector surveys were undertaken between August and October 2017, between April and August 2018 (excluding July) and between April and October 2021 with a total of 70 nights recording undertaken so far. **Table 3** provides details of each recording period.

Table 3: Automated detector survey details

Survey Period	Date	Weather Conditions ⁸				Sunset	Sunrise
		Temperature (°C)		Wind (km/h)	Precipitation (mm)		
		High	Low				
August 2017 (early September)	1 st	20	14	14	0.0	19:53	06:20
	2 nd	19	11	17	0.0	19:51	06:22
	3 rd	16	11	30	0.1	19:48	06:23
	4 th	19	15	19	0.0	19:46	06:25
	5 th	18	15	22	0.0	19:44	06:26
September 2017	21 st	16	10	30	0.0	19:08	06:51
	22 nd	17	6	20	0.0	19:05	06:52
	23 rd	18	12	17	0.0	19:03	06:54
	24 th	20	12	18	0.0	19:01	06:56
	25 th	17	15	9	0.0	18:59	06:57
September 2017 (redeploy)	28 th	18	12	15	0.0	18:52	07:02
	29 th	17	12	20	0.0	18:50	07:03
	30 th	16	10	22	0.0	18:47	07:05
	1 st	16	14	24	0.0	18:45	07:07
	2 nd	17	10	26	0.0	18:43	07:08
October 2017	25 th	18	9	13	0.0	17:54	07:46
	26 th	15	11	9	0.0	17:52	07:48
	27 th	14	4	15	0.0	17:50	07:50
	28 th	15	-1	24	0.0	17:48	07:51
	29 th	15	5	22	0.0	17:48	07:51
April 2018	18 th	20	11	20	0.0	20:05	06:05
	19 th	24	8	13	0.0	20:07	06:03
	20 th	24	7	9	0.0	20:09	06:01
	21 st	20	8	30	0.0	20:10	05:59
	22 nd	19	10	22	0.0	20:12	05:57
May 2018	22 nd	21	11	22	0.0	20:58	05:08

⁸ Weather data is sourced from online weather data (Weather Underground, 2020)

Survey Period	Date	Weather Conditions ⁸				Sunset	Sunrise
		Temperature (°C)		Wind (km/h)	Precipitation (mm)		
		High	Low				
	23 rd	20	9	26	0.0	21:00	05:07
	24 th	14	11	17	0.0	21:01	05:05
	25 th	18	11	9	0.0	21:02	05:04
	26 th	25	14	20	0.0	21:04	05:03
June 2018	15 th	20	7	20	0.0	21:22	04:52
	16 th	16	12	28	0.0	21:22	04:51
	17 th	16	12	28	0.0	21:23	04:51
	18 th	22	14	28	0.0	21:23	04:51
	19 th	21	15	24	0.0	21:24	04:52
June 2018 (redeploy)	26 th	25	10	15	0.0	21:25	04:53
	27 th	26	10	15	0.0	21:24	04:54
	28 th	25	12	22	0.0	21:24	04:54
	29 th	25	13	19	0.0	21:24	04:55
	30 th	27	13	19	0.0	21:23	04:56
August 2018	20 th	22	16	17	0.0	20:19	06:01
	21 st	22	15	17	0.0	20:17	06:02
	22 nd	21	15	15	0.0	20:15	06:04
	23 rd	21	15	20	0.0	20:13	06:06
	24 th	17	10	22	0.0	20:11	06:07
April 2021	21 st	16	14	24	0.0	20:11	05:59
	22 nd	15	11	17	0.0	20:12	05:57
	23 rd	17	13	22	0.0	20:14	05:55
	24 th	16	15	22	0.0	20:16	05:53
	25 th	15	12	24	0.0	20:17	05:51
May 2021 (deployed in June)	2 nd	26	12	17	0.0	21:12	04:57
	3 rd	19	14	24	0.0	21:13	04:56
	4 th	18	13	13	0.0	21:14	04:56
	5 th	21	8	24	0.0	21:15	04:55

Survey Period	Date	Weather Conditions ⁸				Sunset	Sunrise
		Temperature (°C)		Wind (km/h)	Precipitation (mm)		
		High	Low				
	6 th	21	14	19	0.0	21:16	04:54
June 2021	17 th	22	17	17	0.0	21:23	04:51
	18 th	15	13	22	0.0	21:23	04:51
	19 th	15	13	9	0.0	21:24	04:52
	20 th	19	14	13	0.0	21:24	04:52
	21 st	14	12	22	0.0	21:24	04:52
July 2021	21 st	29	15	11	0.0	21:08	05:17
	22 nd	27	15	11	0.0	21:07	5:18
	23 rd	27	15	11	0.0	21:07	5:18
	24 th	22	16	11	0.0	21:05	05:21
	25 th	21	17	22	0.0	21:03	05:22
August 2021	24 th	23	12	22	0.0	20:10	06:08
	25 th	22	12	20	0.0	20:08	06:09
	26 th	21	14	24	0.0	20:06	06:11
	27 th	18	12	19	0.0	20:04	06:12
	28 th	20	11	19	0.0	20:02	06:14
September 2021	10 th	21	18	24	0.0	19:33	06:34
	11 th	21	15	17	0.0	19:31	06:35
	12 th	21	9	7	0.0	19:28	06:37
	13 th	20	12	15	0.0	19:26	06:38
	14 th	21	15	13	0.0	19:24	06:40
October 2021	6 th	17	8	20	0.0	18:34	07:15
	7 th	18	15	15	0.0	18:32	07:16
	8 th	18	14	6	0.0	18:30	07:18
	9 th	18	6	9	0.0	18:27	07:19
	10 th	19	9	15	0.0	18:25	07:21

The automated detectors were deployed by a suitably experienced ECOSA ecologist. The detector programming and data analysis was conducted by Helen Butt, Ecologist of ECOSA.

3.6.3 Survey Limitations

Some bat species, e.g. long-eared bats *Plecotus* species, generally emerge from their roosts in total darkness and do not produce strong echolocations, and therefore these bats can be difficult to observe and record during bat surveys, leading to under-recording.

The quality of both hand-held and automated bat detector recordings is based, to a large extent, on the proximity of a bat to the detector's microphone. Obstructions such as vegetation or environmental variables such as rainfall and wind noise from vegetation will all influence the quality of sound reaching the microphone and thus some bat echolocation recordings are of insufficient quality for specific identification. Bats routinely alter their echolocations in relation to behaviour and their environment. It is not always possible to make a robust identification of every bat recording.

The use of bat detectors is likely to result in the under-recording of a percentage of bats present, such as those flying at height (Collins & Jones, 2009), which would be out of the recording range for the detectors.

Automated detector failures occurred in September 2017 and June 2018. As such, detectors were redeployed for a further five nights within the same month. Deployments scheduled for August 2017 and May 2021 were cancelled due to poor weather conditions. As such, detectors were deployed early the following month. Due to the extent of survey data collected over a number of years and the remaining deployments taking place within optimal conditions, these limitations are not considered to impact the validity of the data.

Transect surveys conducted in 2021 utilised Batlogger M detectors which automatically record bat registrations as opposed to Pettersson D240x time expansion detectors which rely on manual recording using an Edirol device. Consequently, number of bat registrations are likely to be higher for 2021 surveys compared to 2017/2018 surveys. While this does not allow for an equivalent comparison between 2017/18 and 2021, this is not the aim of the updating surveys. Each set of data is stand-alone and the 2021 dataset should be viewed separately to historical data.

⁹ There are two species of long-eared bat, the brown long-eared bat *Plecotus auritus* and the grey long-eared bat *Plecotus austriacus*. These species can only be separated by examination of physical characteristics and Phylogenetic Analysis Identification of bat droppings. Unless confirmation of identification has been made by visual identification the two species shall be referred to in this report as long-eared bat. The brown long-eared bat is the commonest of the two species typically being found roosting within large roof voids although small voids and trees are also utilised. The grey long-eared bat is rare and confined to southern England and like the brown long-eared typically roosts in roof voids.

3.7 Otter Appraisal

3.7.1 Survey Methods

An appraisal of the Lidsey Rife watercourse was undertaken (which forms the eastern site boundary) in order to record any evidence of otter such as spraints, footprints, feeding remains, otter slides, holts and couches. Any evidence encountered was mapped, where appropriate. Where possible to do so, the survey was undertaken from within the watercourse in order to maximise the likelihood of encountering field signs.

3.7.2 Survey Details

The otter appraisal was carried out by Brian Hicks and Jack Medley, Field Ecologist of ECOSA on 22nd November 2018. The weather conditions were sunny with cloudy intervals, approximately 40% cloud cover, an ambient temperature of 5°C and a light wind.

An updating otter appraisal was undertaken by Hugh Turner, Ecologist and Nick Willis, Field Surveyor of ECOSA on 2nd August 2021. The weather conditions were dry with approximately 50% cloud cover, an ambient temperature of 14°C and a light breeze.

3.7.3 Survey Limitations

Land access outside of the ownership of the client was not possible and therefore the otter appraisal was restricted to the length of the Lidsey Rife along the red line boundary plus ten metres up and down stream of this line. Although the appraisal did not extend further (as recommended in best practice guidance).

3.8 Badger Survey

3.8.1 Survey Methods

The survey involved a detailed investigation of the site and its immediate boundaries to identify evidence of badger residence, foraging or territorial activity. This evidence can take the form of latrines, setts, paths between setts or leading to feeding areas, scratching posts at the base of tree trunks, hair traces, snuffle holes formed during foraging, and footprints (Reynolds & Harris, 2005).

Where badger paths were identified these were back tracked in order to establish whether they led to any sett entrances.

Where setts are identified, the location of entrances and direction in which they are travelling are plotted and an assessment made of the level of activity of each entrance. If badger setts are considered to be potentially vulnerable to interference, this information, the assessment of impacts on these setts, and proposed mitigation, is provided in a separate confidential annex.

3.8.2 Survey Details

The badger survey was carried out by Brian Hicks, Field Ecologist of ECOSA on 11th July 2018. The weather conditions were sunny and warm with 0-25% cloud cover, an ambient temperature of 25°C and a light breeze.

The updating badger survey was carried out by Hugh Turner, Ecologist of ECOSA on 2nd August 2021. The weather conditions were dry with approximately 50% cloud cover, an ambient temperature of 14°C and a light breeze.

3.8.3 Survey Limitations

No limitations to the survey were encountered.

3.9 Hazel Dormouse Survey

3.9.1 Survey Methods

The hazel dormouse survey was undertaken in line with current best practice guidelines (Bright, et al., 2006).

The hazel dormouse survey involved the erection of 50 dormouse tubes within suitable dormouse habitat throughout the site at intervals of approximately 15-20 metres. The locations of these tubes are marked on **Map 6**. The nest tubes were subsequently checked for evidence of dormouse on a monthly basis between September and October 2017, between April and August 2018 and between April and June 2021 (an additional three surveys are due to be undertaken between July and September 2021).

In accordance with survey guidance, a value is assigned to each month, which is weighted depending on the likelihood of finding evidence of dormouse in a given month. These scores are based on the erection of 50 dormouse nest tubes. The values for each month that the tubes are in place are then added together. In accordance with survey guidance, absence of dormouse should not be assumed for a search effort of less than 20 points¹⁰. **Table 4** shows points assigned for each month during the survey undertaken.

Table 4: Hazel dormouse survey scores

Month	Score
April	1
May	4
June	2

¹⁰ Each month, between April and November, inclusive is assigned an index of probability score, based on optimum survey timings.

Month	Score
July	2
August	5
September	7
October	2
Total	23

The level of survey effort carried out at site in 2017/2018 provides a search effort of 23, while the survey effort due to be carried out across 2021 will provide a search effort of 21. This allows for a robust assessment of the likely absence of dormouse at the site to be undertaken.

3.9.2 Survey Details

The dormouse tubes were first erected on 1st September 2017 with monthly visits undertaken between September and October 2017 and between April and August 2018. In 2021, the dormouse tubes were erected on 30th March 2021 with monthly visits undertaken between April and August 2021 (to date). One additional survey visit in September is due to be undertaken in 2021. **Table 5** provides details of each hazel dormouse survey.

Table 5: Hazel dormouse survey details

Survey Date	Weather Conditions
19 th September 2017	Dry, muggy, 14°C, 40% cloud cover with a light wind
25 th October 2017	Sunny, 16°C, 30% cloud cover
9 th April 2018	Drizzle, overcast, 8°C, 100% cloud cover with a light wind
10 th May 2018	Sunny, 15°C, 50% cloud cover and a light wind
15 th June 2018	Partly cloudy, 22°C, 30% cloud cover with a gentle breeze
2 nd July 2018	Hot and dry, 31°C, 5% cloud cover with a light wind
9 th August 2018	Drizzle, mild, overcast, 17°C, 100% cloud cover with a light wind
21 st April 2021	Sunny, 50% cloud cover, 13°C with a moderate breeze
4 th May 2021	Dry, 10°C, 80% cloud cover with a moderate breeze
23 rd June 2021	Dry, 19°C, 60% cloud cover with a light breeze
12 th July 2021	Dry, 100% cloud cover with no wind
1 st August 2021	Cloudy, drizzle, 100% cloud cover with a light breeze

The hazel dormouse surveys were co-ordinated and led by Samantha Munslow, Principal Ecologist of ECOSA and Helen Butt, Ecologist of ECOSA assisted by suitably qualified ECOSA surveyors.

The survey was undertaken using 50 dormouse tubes comprising corrugated plastic tubes of standard dimensions (Bright, et al., 2006) with plywood insert secured in the relevant habitat with heavy duty garden wire.

3.9.3 Survey Limitations

No survey limitations were encountered.

3.10 Water Vole Appraisal

3.10.1 Survey Methods

The appraisal consisted of a walkover of the banks of the Lidsey Rife watercourse. The survey area extended approximately ten metres up and down stream of the red line boundary of the site.

The watercourse was surveyed from the banks and from within the watercourse for the identification of water vole signs including burrows, latrines and feeding remains in order to establish the presence/likely absence of the species from the watercourse. In addition, an assessment of the vegetation and bank structure was undertaken to assess its suitability for water vole.

Where evidence of water vole was encountered this was mapped. The best index of water vole abundance is established through number of latrines present in any one given stretch of habitat which provides an indication of the relative density of the species based on the presence of breeding individuals.

The presence/absence of mink, otter and brown rat signs were also recorded noting abundance of evidence recorded. The presence of these three species has a bearing on the likely presence of water vole.

3.10.2 Survey Details

The water vole appraisal was carried out by Brian Hicks, Senior Field Ecologist of ECOSA and Jack Medley, Assistant Ecologist of ECOSA on 22nd November 2018. The weather conditions were sunny with cloudy intervals, approximately 40% cloud cover, an ambient temperature of 5°C and a light wind.

An updating water vole appraisal was undertaken by Hugh Turner, Ecologist and Nick Willis, Field Surveyor of ECOSA on 2nd August 2021. The weather conditions were dry

with approximately 50% cloud cover, an ambient temperature of 14°C and a light breeze.

3.10.3 Survey Limitations

The initial appraisal deviated from general survey guidelines as it was undertaken in November (Strachan, et al., 2011) (Dean, et al., 2016). As such, it is possible that water vole field signs may have been missed. The 2021 water vole appraisal was carried out at the beginning of August when evidence of water vole would likely be recorded (if present).

Land access outside of the ownership of the client was not possible and therefore the otter survey was restricted to the length of the Lidsey Rife along the red line boundary plus ten metres up and down stream of this line. Although the survey did not extend further (as recommended in best practice guidance), it is not considered to be a significant limitation to the survey effort as mitigation during construction and as part of the scheme design will ensure the watercourse and the water quality are suitably protected.

3.11 Reptile Survey

3.11.1 Survey Methods

The reptile survey was undertaken in accordance with current best practice guidelines (Froglife, 2015).

The reptile survey consisted of the laying bitumen felt mats approximately 500mm x 500mm in areas of suitable habitat on the site. Typically, this included areas of suitable habitat with good exposure to the sun. The mats were distributed in all areas considered to offer suitable reptile habitat. The locations of these mats are marked on **Map 6**

The use of such refugia is an effective way of surveying for all species of reptile and current survey guidance states that seven inspections are sufficient to confirm presence/likely absence. Survey visits were undertaken in marginal weather conditions such as cold but sunny weather or hazy and somewhat overcast conditions, as this will maximise the thermal value of the refugia for basking reptiles.

During each visit surveyors also undertook a visual inspection survey of other suitable refugia in the site and other suitable basking locations. During the survey a note was also made of any suitable hibernation features present within the site.

3.11.2 Survey Details

A total of 50 reptile refugia were first distributed on 18th July 2018 with seven inspection visits undertaken between 30th July 2018 and 20th August 2018. .

Table 6 provides details of each reptile survey.

Table 6: Reptile survey details

Survey Date	Air Temperature (°C)	Weather Conditions
30 th July 2018	19°C	Mild and overcast, 50-75% cloud cover and a light breeze
3 rd August 2018	18°C	Mild and overcast, 20-75% cloud cover and a light breeze
7 th August 2018	19°C	Cool and overcast, 50-75% cloud cover and a light breeze
9 th August 2018	17°C	Mild and overcast, 100% cloud cover and a light breeze
10 th August 2018	16°C	Mild and overcast (intermittent rain showers throughout the day), 50-75% cloud cover and a light breeze
16 th August 2018	18°C	Mild, overcast (intermittent rain showers throughout the day), 75-100% cloud cover and a light breeze
20 th August 2018	19°C	Mild with sunny spells, 25-50% cloud cover and a light breeze
4 th May 2021	10°C	Dry, 80% cloud cover and a moderate breeze
17 th June 2021	18°C	Dry, 90% cloud cover and a light breeze
12 th July 2021	19°C	Dry, 100% cloud cover and no wind
2 nd August 2021	15°C	Overcast, 100% cloud cover with a light breeze

The reptile survey was coordinated by Samantha Munslow, Principal Ecologist of ECOSA and Helen Butt, Ecologist of ECOSA, assisted by suitably experienced ECOSA surveyors.

3.11.3 Survey Limitations

No survey limitations were encountered.

3.12 Criteria used to Assess Ecological Value

The evaluation criteria used in this report are based on ECOSA's professional judgement and publicly available publications, survey data and other sources as referenced in the main text. The evaluation is based on a sliding scale of importance as follows; international and European, national, regional, county, local and site. There are a wide range of characteristics which contribute to the importance of ecological features, and these may justify an increase or reduction in the value of an ecological feature. Where deviations occur, these will be explained in the evaluation section of

this report (Section 4.0). Current published relevant guidance, including information sources such as A Nature Conservation Review (Ratcliffe, 1977) and Guidelines for Ecological Impact Assessment in the United Kingdom (CIEEM, 2018) have also been used to inform the assessment.

4.0 BASELINE ECOLOGICAL CONDITIONS AND EVALUATION

4.1 Introduction

This section details the results of the Ecological Impact Assessment undertaken for the site. It assesses the baseline ecological conditions of the site at the time the desktop study was completed and based on the findings of the field survey, subsequent protected species surveys and updating walkover survey. This section also provides an assessment of the ecological value of ecological features present at the site.

4.2 Statutory and Non-statutory Designated Sites

4.2.1 Baseline Ecological Conditions

Details of designated sites are provided in the paragraphs below.

Statutory Designated Sites

There are four statutory designated sites of nature conservation interest situated within five kilometres of the site boundary. These are:

- The Brooks (LNR) – Located approximately 2.5 kilometres north of the site and designated for supporting a range of habitats including meadows, narrow reedbeds and ditches, permanent and temporary ponds, and an extensive newly planted floodplain woodland. The Brooks floods every winter, making it a good place for wetland wildlife;
- Halnaker Chalk Pit (SSSI) – Located approximately 4.5 kilometres north of the site and consist of a partly vegetated pit in the Upper Chalk with peripheral areas of scrub and woodland. Halnaker Chalk Pit is important as the joint location of the largest population of a nationally rare plant species in Great Britain.

This site is most significant for its population of the nationally rare and vulnerable broad-leaved cudweed *Filago pyramidata* with 10,000 plants (1990 figures) comprising approximately 50% of the total British population. Other flowering plant species found on the pit floor include wild basil *Clinopodium vulgare* and wild parsnip *Pastinaca sativa*;

- Felpham (SSSI) – Located approximately 4.7 kilometres south of the site and designated for supporting a new Palaeocene aged flora, one of only three known in the country, which has recently been discovered in the Reading Beds at this site. This assemblage of seeds and fruits is the most diverse known from these Palaeocene strata;
- Earham Pit – Boxgrove (SSSI) – Located approximately five kilometres north of the site and designated for supporting an important archaeological site due to

the presence of a fossil shoreline, seen as a buried cliff, and deposited against this is a complex succession of intertidal and terrestrial sediments which represent a number of different climatic events.

While the Singleton and Cocking Tunnels SAC lies outside five kilometres of the site, it has been scoped into this assessment due to its identification within the South Downs National Park Local Plan (2014-33). Strategic Policy SD10: International Sites states that development proposals should have due regard to the possibility that *Barbastella barbastellus* and Bechstein's bat *Myotis bechsteinii* may utilise a site for foraging and commuting if it lies within 12 kilometres of the Mens SAC, Ebernoe Common SAC and the Singleton and Cocking Tunnels SAC. The site lies over 12 kilometres from the Mens SAC and the Ebernoe SAC, but is located 11.9 kilometres south-east of the Singleton and Cocking Tunnels SAC.

Further details of the statutory designations listed above are provided in **Appendix 8**.

Non-Statutory Designated Sites

There are no non-statutory designated sites of nature conservation situated within one kilometre of the site boundary.

Further information on sites designated for nature conservation are provided in **Appendix 2**.

4.2.2 Evaluation

There are four statutory designated sites of nature conservation located within five kilometres of the site boundary. Of these, the three SSSI designated sites are of national importance, while the LNR designated site is of local importance. The Singleton and Cocking Tunnels SAC is of international importance however this lies outside the five-kilometre search area.

4.3 Habitats

4.3.1 Baseline Ecological Conditions

Desktop Study Results

Consultation with SxBRC produced records of the following notable habitats within the desktop study area: ancient/veteran trees, chalk stream, coastal and floodplain grazing marsh, open water and deciduous woodland. Two ancient/veteran trees were identified 650 metres south-east and 800 metres north of the site. The chalk stream is the Lidsey Rife located on the eastern boundary of the site while areas of floodplain grazing marsh are identified some 760 metres south-east of the site. Two small patches of deciduous woodland are located within one kilometre of the site boundary, the closest of which

lies 400 metres north. The same habitat types were identified during a review of the MAGIC database.

Field Survey Results

Habitats within the site are shown on the Phase 1 Habitat Map (**Map 2**), Target Notes (TN) and Building Numbers (B) are cross referenced to **Map 2**. Photographs have been provided as appropriate. Habitats are described in general terms using standard Phase 1 habitat survey terminology, with reference to dominant, characteristic and notable species in each vegetation type. The main habitats recorded on site during the Phase 1 habitat survey were as follows:

Dense/Continuous Scrub

Scrub consisting mainly of bramble *Rubus fruticosus* aggregate is present in various locations across the site, including along the site boundaries (**Figure 1** and **Figure 2**). Two areas of extensive bramble scrub are present along the western edge of the site. The updating walkover survey in 2020 did not record any material change to scrub habitat on the site.



Figure 1: Bramble scrub in background taken from north-west corner of site (proposed point of site access) (photograph taken in 2017)

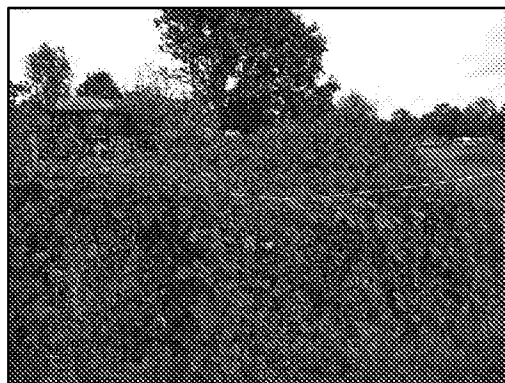


Figure 2: Bramble scrub on western site boundary (photograph taken in 2020)

Scattered Trees

Scattered trees recorded throughout the site, within boundary hedgerows and treelines include field maple *Acer campestre*, hazel *Corylus avellana*, sycamore *Acer pseudoplatanus*, birch *Betula pendula*, willow *Salix* species and ash *Fraxinus excelsior*. A mixture of ornamental and coniferous species are present within the gardens of the three residential properties on site and a number of large mature oak trees *Quercus robur* are scattered throughout the site (**Figure 3**).

Several trees, or groups of trees have Tree Preservation Orders (TPOs) including a number of oaks on the northern boundary, a number of oaks in the centre of the site, and a number of oaks and a hawthorn on the western boundary. The updating walkover

survey in 2020 did not record any material change to scattered trees on the site (**Figure 4**).



Figure 3: Example of scattered trees within the site (photograph taken in 2017)

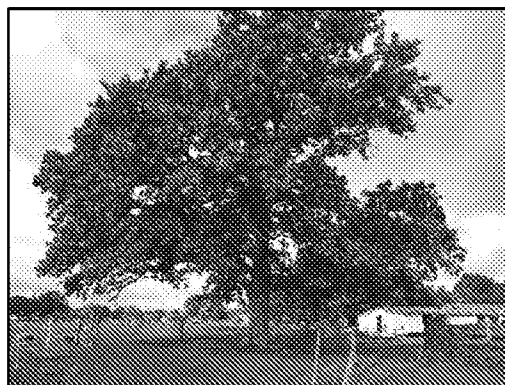


Figure 4: Example of mature oak tree on site (photograph taken in 2020)

Improved Grassland

The site is dominated by horse-grazed paddocks. At the time of the 2017 field survey, two of the paddocks on the eastern area of the site adjacent to the Lidsey Rife had been left ungrazed and had developed a longer sward (**Figure 5**). At the time of the 2020 updating walkover survey, these fields had been grazed and they supported a much shorter grassland sward (**Figure 6**) however site margins remain tussocky. The species recorded across the on-site paddocks included creeping buttercup *Ranunculus repens* and perennial rye-grass *Lolium perenne*. Other species recorded include creeping cinquefoil *Potentilla reptans*, broad-leaved dock *Rumex obtusifolius*, spear thistle *Cirsium vulgare*, meadow grass *Poa* species, meadow foxtail *Alopecurus pratensis*, nettle, rosebay willowherb *Chamerion angustifolium*, Yorkshire fog *Holcus lanatus*, ox-eye daisy *Leucanthemum vulgare*, dandelion *Taraxacum officinale* aggregate, ribwort plantain *Plantago lanceolata* and teasel *Dipsacus* species.

Amenity Grassland

An area of amenity grassland to the rear of The Lodge (**B1**) is mown and well-managed (**Figure 7**). Areas of amenity grassland are also present within the rear garden of the Ryefield Bungalow and south of the Stable Block (**B3**) (**Figure 8**). The updating walkover survey in 2020 did not record any material change to amenity grassland on the site.

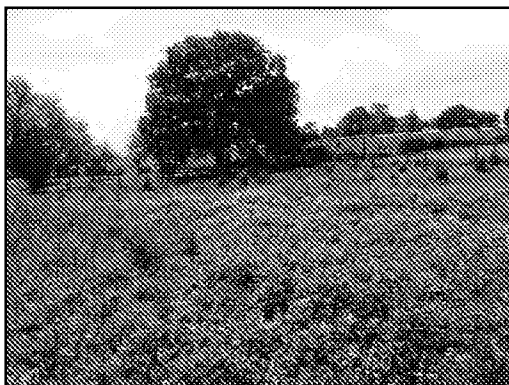


Figure 5: Ungrazed paddock in south-eastern corner of the site (photograph taken in 2017)



Figure 6: South-eastern fields grazed at the time of the survey (photograph taken in 2020)

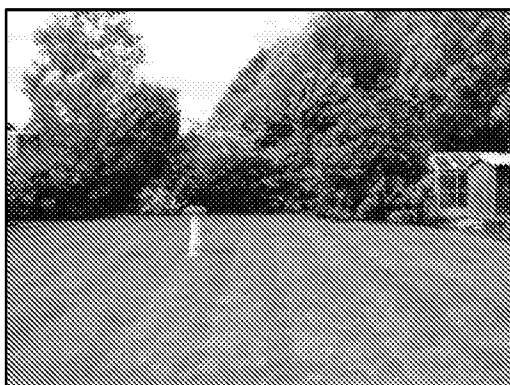


Figure 7: Rear garden of The Lodge (B1) (photograph taken in 2017)



Figure 8: Amenity grassland south of B3 (photograph taken in 2020)

Tall Ruderal

Areas of tall ruderal are present around the edges of the ungrazed paddocks on the eastern edge of the site and in the north-east corner of the site (**Figure 9**). These vegetation communities occur on enriched areas, for example, where horse manure has been stored in the past. Species recorded include hemlock *Conium maculatum*, mugwort *Artemisia vulgaris*, spear thistle, rosebay willowherb and nettle. Ruderal species are also present in the end of the rear garden of The Lodge and along a fenced area between two paddocks in the north-west side of the site. The updating walkover survey in 2020 did not record any material change to tall ruderal habitat on the site (**Figure 10**).

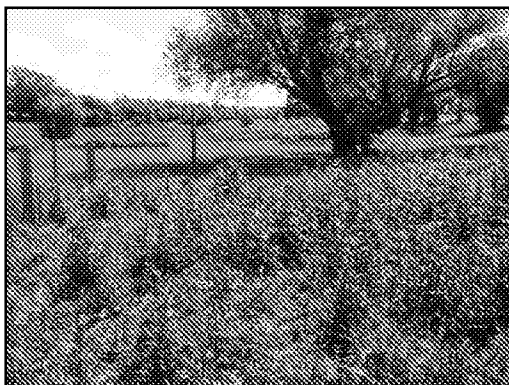


Figure 9: Ruderal vegetation on edge of paddock (photograph taken in 2017)



Figure 10: Ruderal vegetation at field boundaries (photograph taken in 2020)

Hedgerow

There is a small length of species-poor, defunct hedgerow dominated by hawthorn *Crataegus monogyna* located on the north-western corner of the site where it adjoins the houses (**Figure 11**). There is also a species-poor, defunct short section of hedgerow present along the southern site boundary where the site abuts a caravan park. This is dominated by bramble and includes a range of ornamental species associated with the adjacent caravan park (**Figure 12**). There are no other hedgerows within or bounding the site. The updating walkover survey in 2020 did not record any material change to these hedgerows and found their condition to be the same as recorded in 2017.

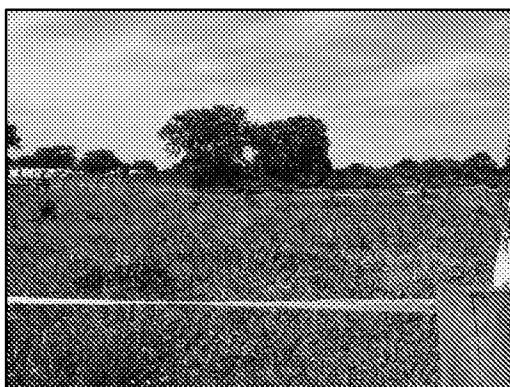


Figure 11: Hedgerow in the rear of the photo (looking towards western site boundary) (photograph taken in 2017)

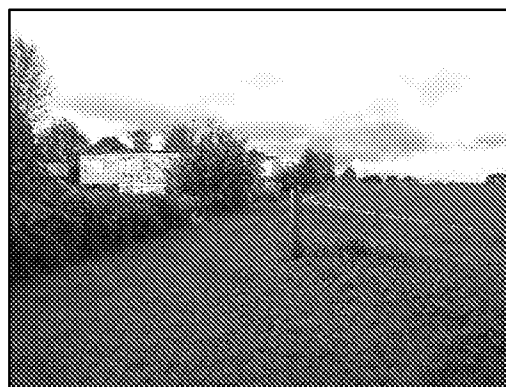


Figure 12: Defunct hedgerow on southern boundary shown at the left of this photograph (photograph taken in 2020)

Buildings

The northern area of the site contains the Woodgate Centre complex. A list of the buildings on site together with descriptions and an assessment in relation to bat roosting suitability is provided in Paragraph 4.4.1 and **Table 7**.

Other Habitats

The majority of buildings on site are surrounded by hardstanding and gravelled areas. Numerous caravans and trailers are present within the building complex. Ornamental planting is present within the gardens of The Lodge (**B1**) and Ryefield Bungalow (**B2**). A track, colonised with ruderal species, is present on the western side of the site entering the site off Woodgate Road. Electric fence bisects the site (forming the paddocks) and runs along the edge of the Lidsey Rife; wooden fence borders much of the western edge of the site. A large manure heap surrounded by hemlock and nettle is present in the north-eastern corner of the site. A manège is located just south of the building complex. A watercourse (outside of the red line site boundary), the Lidsey Rife, adjoins the eastern boundary of the site. The updating walkover survey in 2020 did not record any material change to any of these habitats described above.

4.3.2 Evaluation

Much of the site comprises improved grassland, amenity grassland, buildings, hardstanding, dense scrub and tall ruderal habitats. These are assessed as being of site value only given the context of the site within the wider landscape, as is the species-poor defunct hedgerow.

Habitats of relatively greater value comprise the tree lines and scattered mature oak trees. These are assessed as being of local value within the area of Westergate.

The Lidsey Rife on the eastern boundary, which is a chalk stream, is intrinsically important and is defined as a Habitat of Principal Importance (**Appendix 3**). According to the Sussex Local Wildlife Site Selection Criteria, “all significant areas of habitat of principal importance in England...will be eligible for selection,” where ‘significant’ areas are those capable of providing substantive contribution to the conservation of Habitat of Principal Importance in England. Given the presence of other chalk streams in the local area, including the Ryebank Rife and the Alingbourne Rife, the habitat provided by the Lidsey Rife is considered to be of local value as opposed to county value.

4.4 Bats

4.4.1 Baseline Ecological Conditions

Desktop Study Results

A review of MAGIC revealed that three EPSM licenses for bats have been granted by Natural England within a two-kilometre radius of the site, one from 2014 and two from 2016. All are in relation to the destruction of resting places for common pipistrelle. The nearest is located approximately 1.5 kilometres north-east of the site boundary.

Consultation with SxBRC returned records of eight species of bat within a two-kilometre radius of the site. These are barbastelle, brown long-eared bat *Plecotus auritus*, whiskered bat *Myotis mystacinus*, common pipistrelle *Pipistrellus pipistrellus*, Nathusius' pipistrelle *Pipistrellus nathusii*, noctule *Nyctalus noctule*, serotine *Eptesicus serotinus* and soprano pipistrelle *Pipistrellus pygmaeus*. The records included roosts of serotine, noctule, common pipistrelle and brown long-eared bat.

The Singleton and Cocking Tunnels SAC lies 11.9 kilometres north-west of the site and is designated for supporting barbastelle and Bechstein's bat. The site lies within the 12-kilometre buffer of the SAC as identified within the South Downs National Park Local Plan (2014-33) – Policy SD10. It is possible that these bat species may utilise the site for foraging and commuting.

Field Survey Results

Building Assessment

Buildings on site were found to have varying levels of suitability to support roosting bats. The full results of the building assessment are provided in **Table 7**. Building numbers are shown on **Map 2**. The buildings comprise a mixture of residential dwellings, commercial properties (mainly used for storage or as garages) and stable blocks. The majority of the buildings on site are in active use. The 2020 updating walkover survey did not record any material change to any on-site buildings since the initial building assessment. As such, the suitability of each building to support roosting bats remains the same as in 2017.

Tree Assessment

Both the 2017 field survey and the 2020 updating walkover survey found that a number of the mature oak trees scattered across the site have features which could be suitable for supporting roosting bats. Two examples of potential bat roosting features are shown in **Figure 13** and **Figure 14**.

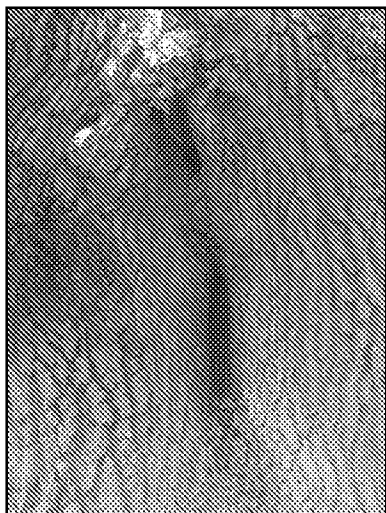


Figure 13: Example bat roost feature within mature oak tree (photograph taken in 2017)

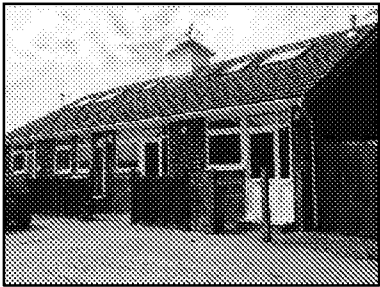
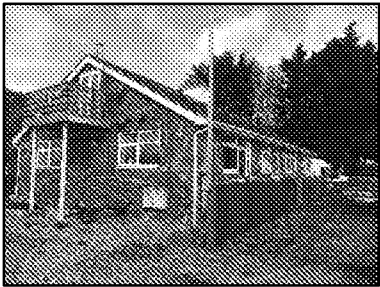


Figure 14: Second example bat roost feature within mature oak tree (photograph taken in 2017)

Foraging and Commuting Habitat

Habitats including hedgerows, scrub and mature trees on site and along the site boundaries are suitable for supporting foraging and commuting bats. The site is situated in a semi-rural setting and is surrounded by well-connected suitable foraging and commuting habitat in the wider area in the form of mature hedgerows, woodland and watercourses. The site is assessed as being of moderate suitability to support foraging and commuting bats.

Table 7: Building Assessment – Summary of Features with Bat Roost Potential and Evidence of Bat Roost Activity

Surveyed Feature	Figure	Building Description	Description of Potential Bat Roost Features	Evidence of Bat Roost Activity and Location	Assessment of Suitability for Roosting Bats
The Lodge (B1)	 Figure 15: Eastern elevation (photograph taken in 2017)  Figure 16: South-eastern corner (photograph taken in 2020)	A semi-detached bungalow of brick construction with a concrete tiled pitched roof with skylights (Figure 15 and Figure 16) and plastic fascias. No roof void is present. Externally, the building appears to be well-sealed with no obvious gaps associated with the roof, brickwork or windows. The house was not accessed internally. Two wooden sheds and a greenhouse are present in the rear garden. None of which have any suitability for roosting bats.	No obvious features were recorded during the survey.	No direct evidence of bat activity was recorded either in 2017 or 2020. An active house sparrow <i>Passer domesticus</i> nest was recorded above a window on the southern elevation in 2017. No internal access was possible during the 2020 updating walkover survey due to the COVID 19 pandemic.	Negligible

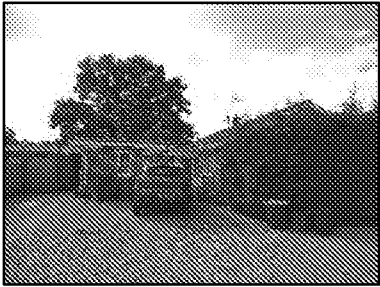
Ryefield Bungalow and Adjacent Toilet Block (B2)	 Figure 17: Ryefield Bungalow (photograph taken in 2020)  Figure 18: Adjacent toilet block (photograph taken in 2017)	A brick built bungalow with plastic fascias (Figure 17) and a single storey toilet block immediately adjacent (Figure 18) with a flat plastic-coated metal roof. No roof void is present in either building. Externally the toilet building is heavily cobwebbed. No internal access was possible during the 2020 updating walkover survey due to the COVID 19 pandemic.	A number of concrete hanging tiles at the rear of the bungalow (southern elevation) are dislodged.	No direct evidence of bat activity was recorded either in 2017 or 2020.	Low (bungalow) Negligible (toilet block)
Stable Block (B3)	 Figure 19: Western end of Stable Block B3 (photograph taken in 2017)	A stable block of brick and breeze block construction with a corrugated metal roof (Figure 20). This building is currently in use. No roof void is present. Internal access was possible.	Gaps created by missing mortar and gaps within brickwork are suitable for crevice dwelling species. The southern elevation is covered in dense ivy (Figure 19) which may provide cover for roosting bats. The open stable doors allow bats to enter the building (Figure 21).	No direct evidence of bat activity was recorded either in 2017 or 2020. Swallow <i>Hirundo rustica</i> nests were found throughout the interior of the building and swallows were regularly seen flying in and out of the building during the survey in 2017. No internal access was possible during the 2020 updating walkover survey due to the COVID 19 pandemic.	High



Figure 20: Right-hand side of photo shows northern elevation of Stable Block B3 (photograph taken in 2020)

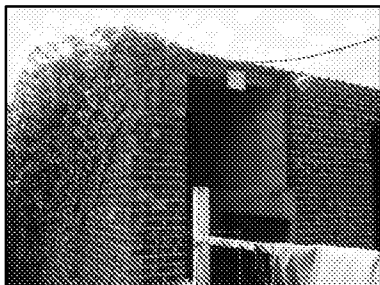
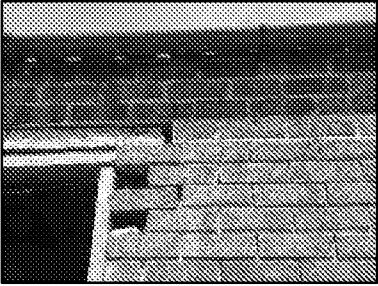
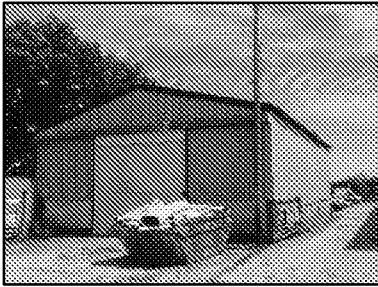
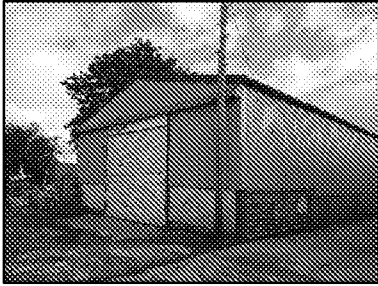
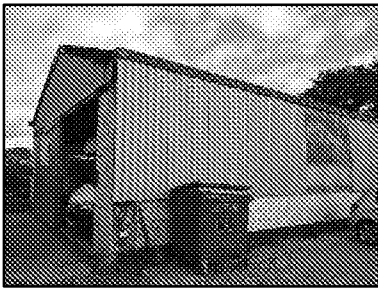
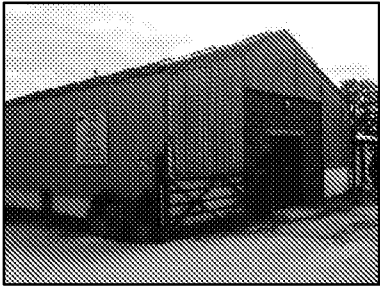
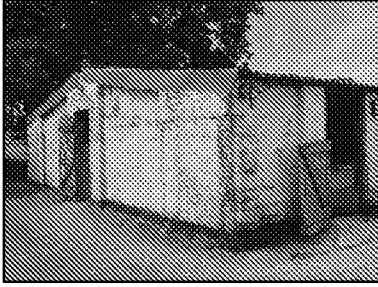


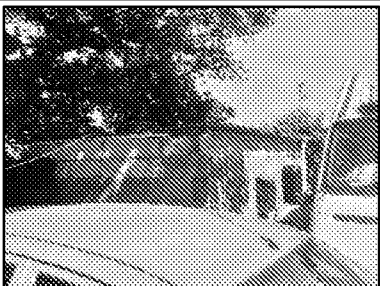
Figure 21: Eastern end of Stable Block B3 (northern elevation) (photograph taken in 2017)

Stable Block (B4)	 Figure 22: Southern elevation (photograph taken in 2017)  Figure 23: Gaps in brickwork - southern elevation (photograph taken in 2017)  Figure 24: Northern elevation showing "garage" side of the building (photograph taken in 2020)	A brick-built building comprising part stable block (southern elevation - Figure 22) and part garages/units with roller shutters (northern elevation - Figure 24). The roof is a mixture of corrugated metal and asbestos. No roof void is present. Internal access was possible.	Various gaps are present in the brickwork on the southern elevation (Figure 23). Open stable doors and gaps between stable doors and door frames provide opportunities for bats to roost within the building.	No direct evidence of bat activity was recorded either in 2017 or 2020. An active robin <i>Erithacus rubecula</i> nest was inside one of the stables within a bale of hay (recorded in 2017). Swallow was also recorded nesting within the building in 2017. No internal access was possible during the 2020 updating walkover survey due to the COVID 19 pandemic.	Moderate (southern elevation only)
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Unit (B5)	 Figure 25: Western elevation (photograph taken in 2017)  Figure 26: Southern western corner (photograph taken in 2020)	A building of breeze block construction clad in plastic coated metal with a pitched corrugated asbestos roof and a roller shutter door (Figure 25 and Figure 26). No roof void is present. No internal access was gained in 2017. No internal access was possible during the 2020 updating walkover survey due to the COVID 19 pandemic.	Gaps present between the plastic-coated metal and brickwork.	No direct evidence of bat activity was recorded either in 2017 or 2020.	Low
Garage (B6)	 Figure 27: Southern elevation of Garage B6 (photograph taken in 2020)	A building of breeze block construction clad in plastic coated metal and corrugated asbestos, with a pitched corrugated asbestos roof (Figure 27). This building is in use. No roof void is present. No internal access was gained in 2017. No internal access was possible during the 2020 updating walkover survey due to the COVID 19 pandemic.	Gaps in broken asbestos on the western and eastern elevations are suitable for access / egress by bats. Gaps present between the plastic-coated metal and brickwork.	No direct evidence of bat activity was recorded either in 2017 or 2020.	Low

Unit (B7)	 Figure 28: North-western elevation (photograph taken in 2017)  Figure 29: Eastern elevation (photograph taken in 2020)	A building of brick and breeze block construction with asbestos and plastic-coated metal (Figure 28 and Figure 29). The roof is pitched and made of corrugated asbestos and plastic sheeting. This building is of similar construction to the Garage (B6) but adjoins a stable block. The interior appears to be light and no roof void is present. No internal access was gained in 2017. No internal access was possible during the 2020 updating walkover survey due to the COVID 19 pandemic.	Gaps present between the plastic-coated metal and brickwork.	No direct evidence of bat activity was recorded either in 2017 or 2020.	Low
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Stable Block (B8)	 Figure 30: Eastern elevation (photograph taken in 2017)  Figure 31: South-eastern elevation (photograph taken in 2017)  Figure 32: Eastern elevation (photograph taken in 2020)	A building of breeze block construction with a pitched corrugated metal and asbestos roof (Figure 30, Figure 31 and Figure 32). Part of the building consists of roller shuttered storage units. The building is in use. No roof void is present. Internal access was gained. No internal access was possible during the 2020 updating walkover survey due to the COVID 19 pandemic.	The open stable doors allow bats to roost inside the building. Gaps in brickwork. Gaps between roof and brickwork.	No direct evidence of bat activity was recorded either in 2017 or 2020. Swallows were recorded nesting within the building in 2017.	Moderate
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Units (B9)	 Figure 33: Small breeze block building (photograph taken in 2017)	Two buildings of breeze block construction with half-pitched corrugated asbestos roofs and an open nature (Figure 33). No roof void is present. Internal access was gained in 2017. No internal access was possible during the 2020 updating walkover survey due to the COVID 19 pandemic.	Neither building offers suitability for roosting bats.	No direct evidence of bat activity was recorded either in 2017 or 2020.	Negligible
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Bat Ground Level Tree Assessment and Climb and Inspect Survey Results

The results of the Ground Level Tree Assessment and Tree Climb and Inspect survey of the on-site trees are provided in **Table 8**. Details of tree locations and levels of bat suitability are provided in **Map 3**. A total of 22 trees were inspected during the Ground Level Tree Assessment. Three trees were identified as having high suitability for roosting bats and two with low suitability. A total of six trees were identified as requiring a further Tree Climb and Inspect survey. During the Tree Climb and Inspect survey, each of the trees which were possible to climb were re-assessed based on the closer inspection. The last column in **Table 8** provides the final assessment “score” of each of the trees on the site for roosting bats; this suitability assessment is based on the results of both Ground Level Tree Assessment and the Tree Climb and Inspect survey (where the tree was possible to climb).

Table 8: Tree Assessment Results in Relation to Roosting Bats

Tree Number	Species and Description	Description of Features	Climbed	Suitability for Bats
1	Oak	Ivy-clad trunk, no visible Potential Bat Roost Features. It was not necessary to climb and inspect this tree.	N	Low
2	Oak	Ivy-clad trunk, downward facing limb scar upon first inspection from ground. Climb and inspect survey downgraded suitability as limb scar is sealed.	Y	Negligible
3	Oak	Ivy-clad trunk, limb scar extends in about 35cm. Split on branch on western aspect is suitable roost feature.	Y	Moderate
4	Willow	Hollow trunk extends into a hole. Not possible to climb and inspect for H&S reasons.	N	High
5	Willow	Ivy-clad trunk, hollow limb and trunk. Not possible to climb and inspect for H&S reasons.	N	High
6	Oak	Ivy-clad trunk, no visible Potential Bat Roost Features	N	Low
7	Oak	No visible Potential Bat Roost Features	N	Negligible
8	Oak	No visible Potential Bat Roost Features	N	Negligible
9	Willow	Hollow trunk. This tree is just outside of the red line boundary of the site and was not climbed and inspected as a result.	N	High
10	Oak	Hollow trunk at base, appears to extend into trunk about 10cm.	Y	Low

Tree Number	Species and Description	Description of Features	Climbed	Suitability for Bats
11	Oak	Heavily ivy-clad trunk, no visible Potential Bat Roost Features	Y	Low
12	Oak	No visible Potential Bat Roost Features	N	Negligible
13	Pear	Ivy-clad trunk, no visible Potential Bat Roost Features	N	Negligible
14	Pear	Ivy-clad trunk, no visible Potential Bat Roost Features	N	Negligible
15	Oak	No visible Potential Bat Roost Features	N	Negligible
16	Oak	Callous roll on northern side but does not extent. Hollow trunk visible on northern side but does not extent up into tree.	Y	Negligible
17	Oak	Heavily ivy-clad trunk on lower section, no visible Potential Bat Roost Features	Y	Low
18	Leyland cypress	No visible Potential Bat Roost Features	N	Negligible
19	Eucalyptus	No visible Potential Bat Roost Features	N	Negligible
20	Oak	No visible Potential Bat Roost Features	N	Negligible
21	Oak	No visible Potential Bat Roost Features	N	Negligible
22	Leyland cypress	No visible Potential Bat Roost Features	N	Negligible

Bat Emergence/Re-entry Survey Results

The surveys recorded a total of six species of bat: noctule, common pipistrelle, soprano pipistrelle, *Myotis* species, serotine and long-eared bat. A single soprano pipistrelle was recorded re-entering B3 during the survey carried out on the 29th August 2017. No bats were recorded emerging from/re-entering any of the other buildings during the surveys.

The majority of registrations were of common pipistrelle and soprano pipistrelle across all surveys. A total of six registrations were recorded of serotine, six of noctule, five of *Myotis* species and two of long-eared bat.

Table 9 provides details of the species, numbers and locations of bats recorded roosting and foraging/commuting during the emergence/re-entry surveys. Locations of bat emergences and re-entries are shown on **Map 4**.

Table 9: Bat Emergence/Re-entry Survey Results of Buildings and Tree

Visit 1 - Survey Details			
Survey Date:	29 th August 2017		
Structures Surveyed:	B3		
Survey Type:	Dusk Emergence Survey		
Time of Sunset:	21:54		
Recorded Bat Roosts			
Species	Number of bats	Emergence Time	Roosting/Access Feature
Soprano pipistrelle	1	20:35	A single soprano pipistrelle was recorded emerging from B3 through one of garage doors.
General Bat Activity			
Bat activity levels were moderate for the duration of the survey with a maximum of 11 registrations. Foraging activity was intermittent with the most activity recorded between 20:51 and 21:21. The majority of activity was recorded east of the building.			

Visit 2 - Survey Details	
Survey Date:	4 th September 2017
Structures Surveyed:	B4
Survey Type:	Dusk Emergence Survey
Time of Sunset:	19:40
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were low for the duration of the survey. Foraging activity by a small number of bats was recorded to the east of the building with a total of 11 registrations recorded. The majority of activity was attributable to common pipistrelle, with just one registration of soprano pipistrelle and of noctule.	

Visit 3 - Survey Details	
Survey Date:	5 th September 2017
Structures Surveyed:	B6, B7, B8
Survey Type:	Dusk Emergence Survey
Time of Sunset:	19:39
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were moderate throughout the survey with the majority of registrations attributable to common pipistrelle. Four registrations were attributable to serotine, one to soprano pipistrelle and one to noctule.	

Visit 4 - Survey Details	
Survey Date:	6 th September 2017
Structures Surveyed:	B1, B5
Survey Type:	Dusk Emergence Survey
Time of Sunset:	19:37
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were low throughout the survey with the majority of registrations attributable to common pipistrelle. Three registrations were attributable to <i>Myotis</i> species.	

Visit 5 - Survey Details	
Survey Date:	19 th September 2017
Structures Surveyed:	B3
Survey Type:	Dusk Emergence Survey
Time of Sunset:	19:06
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were very low throughout the survey with all registrations attributable to common pipistrelle. All recordings were made at the start of the survey between 19:41 and 19:52.	

Visit 6 - Survey Details	
Survey Date:	21 st September 2017
Structures Surveyed:	B4
Survey Type:	Dawn Re-Entry
Time of Sunrise:	06:48
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were very low throughout the survey with just two registrations recorded, both attributable to common pipistrelle.	

Visit 7 - Survey Details	
Survey Date:	22 nd May 2018
Structures Surveyed:	B2
Survey Type:	Dusk Emergence Survey
Time of Sunset:	20:55
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were low throughout the survey with 15 registrations recorded of common pipistrelle and a single registration of long-eared bat. The majority of bats were recorded as 'heard not seen'.	

Visit 8 - Survey Details	
Survey Date:	1 st June 2018
Structures Surveyed:	B3, B8
Survey Type:	Dawn Re-Entry Survey
Time of Sunrise:	04:55
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were very low throughout the survey with the majority of registrations attributable to common pipistrelle and just one registration of noctule. The majority of bats were recorded as 'heard not seen'.	

Visit 9 - Survey Details	
Survey Date:	21 st July 2021
Structures Surveyed:	B3, B4
Survey Type:	Dusk Emergence Survey
Time of Sunset:	21:07
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were very low throughout the survey with the majority of registrations attributable to common pipistrelle, fewer of soprano pipistrelle and just one registration of noctule. The majority of bats were recorded as 'heard not seen'.	

Visit 10 - Survey Details	
Survey Date:	4 th August 2021
Structures Surveyed:	B3, B4
Survey Type:	Dawn Re-Entry
Time of Sunrise:	05:36
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were very low throughout the survey with a low number of registrations recorded. The majority of registrations were attributable to common pipistrelle and just one registration of soprano pipistrelle and one of noctule.	

Visit 11 - Survey Details	
Survey Date:	20 th August 2021
Structures Surveyed:	B1, B2, B5
Survey Type:	Dusk Emergence Survey
Time of Sunset:	20:17
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were very low throughout the survey with a low number of registrations recorded. The majority of registrations were attributable to common pipistrelle and just one registration of soprano pipistrelle and one of noctule.	

Visit 12 - Survey Details	
Survey Date:	24 th August 2021
Structures Surveyed:	B6, B8
Survey Type:	Dusk Emergence Survey
Time of Sunset:	20:08
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were very low throughout the survey with a low number of registrations recorded. The majority of registrations were attributable to common pipistrelle and relatively fewer registrations of soprano pipistrelle, noctule and one of <i>Myotis</i> .	

Visit 13 - Survey Details	
Survey Date:	20 th September 2021
Structures Surveyed:	B3, B7, B8
Survey Type:	Dusk Emergence Survey
Time of Sunset:	29:08
Recorded Bat Roosts	
No bats were recorded roosting with the building	
General Bat Activity	
Bat activity levels were very low throughout the survey with a low number of registrations recorded. The majority of registrations were attributable to common pipistrelle and relatively fewer registrations of soprano pipistrelle, noctule and one of <i>Myotis</i> .	

Bat Transect Survey Results

Bat transect surveys were undertaken between August 2017 and June 2018 and were updated between April and October 2021. During which time a total of six species of bat were recorded within the site including common pipistrelle, soprano pipistrelle, *Myotis* species, noctule, serotine and long-eared bat.

Across the transect surveys, the majority of foraging and commuting activity was attributable to common pipistrelle, with fewer registrations of soprano pipistrelle, *Myotis* species, long-eared bat, serotine and noctule. Activity was generally spread evenly across the site with a slight peak in activity in the north-eastern corner of the site as well as commuting behaviour recorded along the southern and eastern boundaries. The locations of the bat activity recorded are provided on **Map 5** with a summary of the findings of each survey provided in **Table 10**.

It should be noted that transect surveys conducted in 2021 utilised Batlogger M detectors which automatically record bat registrations as opposed to Pettersson D240x time expansion detectors which rely on manual recording using an Ediol device. Consequently, number of bat registrations are likely to be higher for 2021 surveys compared to 2017/2018 surveys.

Table 10: Bat Activity Recorded During Transect Surveys

Survey Date	General Bat Activity at the Site
22 nd August 2017	Bat activity levels were low-moderate with a total of 20 registrations manually recorded. The majority of registrations were attributable to common pipistrelle, with two registrations of serotine and one of <i>Myotis</i> species. Activity was fairly evenly spread across the site, with a slight peak in activity in the north-western corner of the site.

Survey Date	General Bat Activity at the Site
19 th September 2017	Bat activity levels were low-moderate with a total of 16 registrations recorded manually. The majority of registrations were of common pipistrelle, with one registration of long-eared bat. The bat activity was recorded sporadically around the site, with a slightly higher proportion of activity recorded in the north-western corner.
5 th October 2017	Bat activity levels were low-moderate with a total of 14 registrations manually recorded. All the registrations were attributable to common pipistrelle. As during the previous surveys, the majority of foraging activity was recorded in the north-eastern corner as well as the south-eastern corner of the site. A small number of bats were also recorded commuting along the southern boundary.
23 rd October 2017	Bat activity levels were low-moderate with a total of 16 registrations manually recorded. The majority of registrations were attributable to common pipistrelle, with just one registration of long-eared bat. Continuous foraging activity was recorded along the eastern elevation, while a small number of bats were recorded commuting along the southern boundary.
26 th April 2018	Bat activity levels were low with a total of ten registrations recorded manually. The majority of registrations were attributable to common pipistrelle with just one registration of soprano pipistrelle. Bat activity was recorded sporadically across the site with no peak in activity at any given location.
21 st May 2018	Bat activity levels were moderate with a total of 44 registrations recorded manually. The majority of registrations were attributable to common pipistrelle, with one registration of serotine and two of soprano pipistrelle. The majority of activity was recorded along the northern boundary, close to where the on-site buildings are located, however activity was generally spread across the site.
18 th June 2018	Bat activity levels were low with a total of ten registrations recorded manually. The majority of registrations were attributable to common pipistrelle with just one registration of long-eared bat. Activity was recorded sporadically across the site with no peak in activity in any one location.
26 th April 2021	Bat activity levels were moderate with a total of 32 registrations recorded. 29 of these were attributable to common pipistrelle and only 3 were attributable to soprano pipistrelle. No other species were recorded during the survey. Activity was largely concentrated within the northern part of the site, particularly the north-western corner.
25 th May 2021	Bat activity levels during the survey were high with a total of 87 registrations recorded of six species: soprano pipistrelle, noctule, <i>Myotis</i> species, common pipistrelle, serotine and brown long-eared bat. The majority of registrations (69) were of common pipistrelle. Recordings were made across the whole site however most activity was recorded along the eastern site boundary.
23 rd June 2021	Bat activity levels were moderate with a total of 52 registrations recorded; 36 of common pipistrelle, 15 of soprano pipistrelle and one of brown long-eared bat. Activity was spread relatively evenly across the site.

Survey Date	General Bat Activity at the Site
19 th /20 th July 2021	Bat activity levels were moderate during the dusk/dawn transect survey with 22 registrations recorded during the dusk survey and 67 during the dawn survey. The vast majority of recordings were attributable to common pipistrelle with fewer registrations of soprano pipistrelle, noctule and long-eared bat. The most concentrated areas of activity were in the south-wester corner of the site and within the eastern half of the site adjacent to mature oaks.
25 th August 2021	Bat activity levels during the survey were high with a total of 94 registrations recorded of six species: soprano pipistrelle, noctule, <i>Myotis</i> species, common pipistrelle, serotine and brown long-eared bat. The majority of registrations (80) were of common pipistrelle. Recordings were made across the whole site.
20 th September 2021	Bat activity levels during the survey were high with a total of 73 registrations recorded of four species: soprano pipistrelle, noctule, <i>Myotis</i> species and common pipistrelle. The majority of registrations (6) were of common pipistrelle. Recordings were made across the whole site with a focus on the south-western corner of the site and the northern boundary.
13 th October 2021	Bat activity levels were moderate with a total of 43 registrations recorded; 40 of common pipistrelle, one of soprano pipistrelle, one of brown long-eared bat and one of serotine. The majority of activity was recorded along the northern boundary of the site.

Bat Automated Detector Survey Results

The automated bat detector 2021 survey results recorded a total of 13,288 bat registrations of at least eight species: common pipistrelle, *Myotis* species, noctule, Leisler's bat *Nyctalus leisleri*, soprano pipistrelle, long-eared bat, serotine, barbastelle and Nathusius' pipistrelle. Due to the large amount of data collected over previous years, automated detectors data from 2017 and 2018 has not been included in this report.

Activity by Species

Table 11 shows the number of registrations and proportion of recorded bat activity at the site by species in 2021. The results show that the vast majority of bat activity at the site was attributable to common pipistrelle (90.59% of all registrations recorded). The second most frequently recorded species was soprano pipistrelle (6.36% of all registrations recorded). The remaining seven species represented less than 1% each of all registrations recorded.

Table 11: Number of Registrations and Proportion of Bat Activity from Each Species for 2021 Surveys

Species	No. Registrations	% Registrations
Common pipistrelle	12037	90.59%
Soprano pipistrelle	845	6.36%
Serotine	127	0.96%
Noctule	125	0.94%
Myotis species	54	0.41%
Long-eared bat species	51	0.38%
Nathusius' pipistrelle	37	0.28%
Leisler's bat	10	0.08%
Barbastelle	2	0.02%
Grand Total	13288	100.00%

Species Activity by Month

Table 12 provides the number of registrations of each species recorded within each month in 2021. The results show that bat activity levels were highest during May, July and September 2021, with the fewest registrations recorded in April 2021.

Table 12: Number of Registrations of Each Month Split by Species for 2021 Surveys

Period	Species	No. Registrations	Activity Index
Apr-21	Common pipistrelle	75	7.5
	Soprano pipistrelle	15	1.5
	Serotine	1	0.1
Apr-21 Total		91	9.1
May-21	Common pipistrelle	2736	273.6
	Myotis species	1	0.1
	Noctule	8	0.8
	Soprano pipistrelle	188	18.8
	Serotine	119	11.9
	Nathusius' pipistrelle	8	0.8
	Barbastelle	1	0.1
May-21 Total		3061	306.1
Jun-21	Common pipistrelle	630	63
	Myotis species	1	0.1
	Noctule	4	0.4
	Soprano pipistrelle	32	3.2
	Serotine	7	0.7
	Nathusius' pipistrelle	8	0.8
Jun-21 Total		682	68.2
Jul-21	Common pipistrelle	4903	490.3
	Myotis species	10	1
	Noctule	20	2
	Soprano pipistrelle	213	21.3

	Nathusius' pipistrelle	6	0.6
Jul-21 Total		5152	515.2
Aug-21	Common pipistrelle	557	55.7
	Myotis species	10	1
	Noctule	22	2.2
	Soprano pipistrelle	177	17.7
Aug-21 Total		766	76.6
Sep-21	Common pipistrelle	2816	281.6
	Myotis species	26	2.6
	Noctule	57	5.7
	Soprano pipistrelle	190	19
	Nathusius' pipistrelle	10	1
	Barbastelle	1	0.1
Sep-21 Total		3100	310
Oct-21	Common pipistrelle	320	32
	Myotis species	6	0.6
	Noctule	14	1.4
	Soprano pipistrelle	30	3
	Nathusius' pipistrelle	5	0.5
Oct-21 Total		375	37.5
Grand Total		13227	188.9571429

Activity Levels at Locations

Table 13 shows the number of registrations recorded at each individual location throughout the 2021 survey period. The results show that overall, bat activity levels at Location A were much higher than bat activity levels at Location B with the exception of June and July. Location A is situated at the south-eastern corner of the site, adjacent to the Lidsey Rife and bounded by fields to the east. Location B is situated in the north-western corner of the site, closer to the residential development of Westergate. This may go some way to explain why activity levels were higher at Location A.

Table 13: Activity Recorded at Each Location n 2021

Period	Location	Species	Count of Species	Activity Index
Apr-21	Location A	Common pipistrelle	66	13.2
		Soprano pipistrelle	11	2.2
	Location A Total		77	15.4
	Location B	Common pipistrelle	9	1.8
		Soprano pipistrelle	4	0.8
		Serotine	1	0.2
	Location B Total		14	2.8
May-21	Location A	Common pipistrelle	2376	475.2
		Myotis species	1	0.2
		Soprano pipistrelle	176	35.2

		Serotine	1	0.2
		Nathusius' pipistrelle	8	1.6
		Barbastelle	1	0.2
	Location A Total		2563	512.6
	Location B	Common pipistrelle	360	72
		Noctule	8	1.6
		Soprano pipistrelle	12	2.4
		Serotine	118	23.6
	Location B Total		498	99.6
	Jun-21	Location A	Common pipistrelle	31
Noctule			1	0.2
Soprano pipistrelle			9	1.8
Location A Total		41	8.2	
Location B		Common pipistrelle	599	119.8
		Myotis species	1	0.2
		Noctule	3	0.6
		Soprano pipistrelle	23	4.6
		Serotine	7	1.4
		Nathusius' pipistrelle	8	1.6
		Location B Total		641
Jul-21		Location A	Common pipistrelle	451
	Myotis species		5	1
	Noctule		10	2
	Soprano pipistrelle		96	19.2
	Nathusius' pipistrelle		2	0.4
	Location A Total		564	112.8
	Location B	Common pipistrelle	4452	890.4
		Myotis species	5	1
		Noctule	10	2
		Soprano pipistrelle	117	23.4
		Nathusius' pipistrelle	4	0.8
	Location B Total		4588	917.6
Aug-21	Location A	Common pipistrelle	429	85.8
		Myotis species	6	1.2
		Noctule	7	1.4
		Soprano pipistrelle	142	28.4
	Location A Total		584	116.8
	Location B	Common pipistrelle	128	25.6
		Myotis species	4	0.8
		Noctule	15	3
		Soprano pipistrelle	35	7
	Location B Total		182	36.4
Sep-21	Location A	Common pipistrelle	1802	360.4
		Myotis species	19	3.8
		Noctule	32	6.4
		Soprano pipistrelle	85	17

		Nathusius' pipistrelle	5	1
		Barbastelle	1	0.2
	Location A Total		1944	388.8
	Location B	Common pipistrelle	1014	202.8
		Myotis species	7	1.4
		Noctule	25	5
		Soprano pipistrelle	105	21
		Nathusius' pipistrelle	5	1
	Location B Total		1156	231.2
Oct-21	Location A	Common pipistrelle	273	54.6
		Myotis species	3	0.6
		Noctule	2	0.4
		Soprano pipistrelle	27	5.4
		Nathusius' pipistrelle	3	0.6
	Location A Total		308	61.6
	Location B	Common pipistrelle	47	9.4
		Myotis species	3	0.6
		Noctule	12	2.4
		Soprano pipistrelle	3	0.6
		Nathusius' pipistrelle	2	0.4
	Location B Total		67	13.4
	Grand Total		13227	188.9571429

4.4.2 Evaluation

Roosting Bats

A soprano pipistrelle roost was recorded as present in B3 in August 2017. Given that only a single bat of a common and widespread species was recorded roosting within the building, the roost is assessed as being a low status day roost. Three trees are assessed as having high suitability for roosting bats, one as moderate and five as low. Given that only a single building supports a low status roost or a common species, and the extent of mature trees on and off site, including at least three ancient/veteran trees identified within the desk study, the site is assessed as being of no more than site value to roosting bats overall.

Foraging and Commuting Bats

Bat surveys recorded a total of eight species of bat foraging and commuting at the site. The geographic level of value of foraging and commuting habitat at the site for each species is assessed as being 'local'.

Given the extent of highly suitable foraging and commuting habitat in the wider area including mature hedgerows and watercourses, the site itself is assessed as being of site value to foraging and commuting bats. However, the Lidsey Rife located

immediately to the east of the site boundary is assessed as being of local value to commuting bats. This linear feature connects the site to further likely commuting routes including the railway line to the north, as well as foraging areas including field margins and hedgerows.

The Annex II species barbastelle was recorded at the site. Although this is a rarer species, only two registrations of barbastelle were recorded (0.02% of all registrations at the site) which may be attributable to a low number of bats. As such, the habitat on site is also assessed as being of local value to barbastelle. The findings of the 2021 surveys do not alter the assessment of the site value to foraging and commuting bats compared to the 2017/2018 survey findings.

4.5 Otter

4.5.1 Baseline Ecological Conditions

Desktop Study Results

Otter records are not provided by the SxBRC data search as they are confidential, however, this does not confirm the absence of the species in the local area.

Field Survey Results

The tall vegetation on the banks of the Lidsey Rife meant the surveyor could not see the watercourse itself or the banks clearly during the initial survey. The watercourse was not surveyed during the 2020 updating walkover. There are no mature trees along the stretch of the river where it adjoins the site and no other features visible that could suggest suitability for holt construction within the banks. The area of land immediately south of the site (adjoining the Lidsey Rife), associated with the caravan park, is a picnic area and therefore subject to disturbance, certainly during the summer months, reducing the suitability of this stretch of the river for otter. The watercourse may, however, serve as a commuting corridor for this species.

Otter Appraisal Results

During the otter appraisal, a number of narrow mammal trails were recorded within riparian vegetation on the western bank in both 2017 and 2021, some of which terminate at the water's edge indicating that the animals had entered the water. A number of small mammal prints were also recorded on both banks of the Lidsey Rife in 2017. These are considered likely to be attributable to rat.

4.6 Badger

4.6.1 Baseline Ecological Conditions

Desktop Study Results

Badger records are not provided by the SxBRC data search as the records are confidential, however, this does not confirm the absence of the species in the local area.

Field Survey Results

No signs or direct evidence of badger was recorded during the initial survey or the updating walkover survey conducted in 2020. The site contains suitable badger habitat in the form of open grassland and scrub and, given the site's semi-rural setting and the presence of the railway line to the north (providing suitable habitat for badger), it is considered highly likely that badgers will be present within the surrounding landscape. The site generally lacks suitable habitat for sett construction and is regularly disturbed by human activity and horse-grazing. It is possible, however, that badger could visit the site for foraging or commuting.

Badger Survey Results

No evidence of badger was recorded during the survey in 2017 or 2021, including setts, latrines or evidence of foraging. The site does, however, offer suitable habitat to foraging and it is possible that badger pass through the site to forage as well as to access habitat in the wider landscape. As such, it cannot be ruled out that badger is present.

4.6.2 Evaluation

As the available habitat is limited in extent in the context of the wider area, the site is likely to be of value at the site level only.

4.7 Hazel Dormouse

4.7.1 Baseline Ecological Conditions

Desktop Study Results

Consultation with SxBRC produced no records of hazel dormouse within the desktop study area, however, this does not confirm the absence of the species in the local area. No EPSM licenses for hazel dormouse have been granted by Natural England within a two-kilometre radius of the site.

Field Survey Results

The boundary hedgerow, dense bramble scrub along the western site boundary and, to a lesser extent, the dense bankside reed vegetation along the Lidsey Rife, provide

suitable conditions for hazel dormouse. Habitat on site connects to that of the railway line corridor (and potential hazel dormouse habitat) to the north increasing the potential suitability of the site for this species. The 2020 updating walkover survey found that these habitats remain suitable for hazel dormouse.

Hazel Dormouse Survey Results

The hazel dormouse surveys conducted in 2017/2018 and in 2021 confirmed the likely absence of dormouse within the site. The results of the hazel dormouse surveys to date are presented in **Table 14**. Locations of the dormouse tubes are provided on **Map 6**.

Table 14: Hazel dormouse survey results

Survey Date	Results
19 th September 2017	No evidence of hazel dormouse, or any other species recorded.
25 th October 2017	No evidence of hazel dormouse, or any other species recorded.
9 th April 2018	No evidence of hazel dormouse recorded. Two old wood mouse nests were recorded in nest tubes located within scrub on the eastern boundary. A food cache likely attributable to wood mouse was recorded on the northern boundary.
10 th May 2018	No evidence of hazel dormouse, or any other species recorded.
15 th June 2018	No evidence of hazel dormouse was recorded. A single wood mouse nest was recorded along the eastern boundary.
2 nd July 2018	No evidence of hazel dormouse recorded. A possible wood mouse nest was recorded along the northern boundary.
9 th August 2018	No evidence of hazel dormouse recorded. Two wood mouse nests were recorded along the eastern boundary and a single wood mouse nest located along the northern boundary.
21 st April 2021	No evidence of hazel dormouse, or any other species recorded.
4 th May 2021	No evidence of hazel dormouse, or any other species recorded.
23 rd June 2021	No evidence of hazel dormouse, or any other species recorded.
12 th July 2021	No evidence of hazel dormouse recorded. A food cache likely attributable to wood mouse was recorded on the northern boundary.
1 st August 2021	No evidence of hazel dormouse was recorded. A single wood mouse nest was recorded along the eastern boundary.
28 th September 2021	No evidence of hazel dormouse, or any other species recorded.

Hazel dormouse is considered likely absent from the site, and the species is not considered further in this report.

4.8 Water Vole

4.8.1 Baseline Ecological Conditions

Desktop Study Results

Three records of water vole from 1996, 2012 and 2013 were returned by SxBRC, located approximately 600 metres south of the site on the Lidsey Rife and at the Lidsey Sewage Works some 650 metres south-east.

Field Survey Results

The Lidsey Rife provides suitable habitat for water vole in the form of dry areas above the water level for nesting and herbaceous vegetation on the banks to provide food and cover. As such, it is possible that

Water Vole Appraisal Results

Two small holes in the bank were recorded during the water vole survey in 2017, one located on the exposed eastern bank and the other in a much more vegetated area on the western bank. A number of small mammal trails were recorded within the riparian vegetation on the western bank, some of which terminated at the water's edge, indicating that the animal had entered the water. A number of small mammal prints were also recorded on both banks.

During the updating water vole appraisal conducted in 2021 the vegetation along the banks of the Lidsey Rife was dense and tall, however six latrine sites attributable to water vole (one on the eastern bank and five on the western bank) were recorded along the stretch of the Lidsey Rife that bounds the site to the east (**Figure 34** and **Figure 35**) and a single burrow was recorded within the eastern riverbank. These field signs confirm the presence of water vole within the watercourse (see **Map 6** for locations of water vole evidence).



Figure 34: Example of water vole latrine



Figure 35: Water vole latrine recorded along Lidsey Rife

4.8.2 Evaluation

In accordance with current guidelines (Dean, et al., 2016) the number of latrines recorded give an indication of relative population size. The survey area is subdivided into areas supporting water vole at 'high', 'medium' and 'low' density, which can be interpreted as follows:

Relative Population Density	Approximate number of latrines per 100 metres of bankside habitat (July to September)
High	20 or more
Medium	6-19
Low	Less than or equal to 5 (or none, but with other confirmatory field signs)

As such, it can be concluded that this section of the Lidsey Rife is likely to support a low population density of water vole. In accordance with current guidelines (Dean, et al., 2016), every five latrines represents the territory of a single breeding female. As six latrines were recorded, it can be assumed that between one and two breeding females are present along this section of the Lidsey Rife.

4.9 Birds

4.9.1 Baseline Ecological Conditions

Desktop Study Results

SxBRC returned a large number of bird records within a one-kilometre radius of the site boundary comprising garden, woodland and waterfowl species. Species likely to be utilising habitat either on site or immediately adjacent, include bullfinch *Pyrrhula pyrrhula*, kestrel *Falco tinnunculus*, marsh tit *Poecile palustris* and stock dove *Columba oenas*, kingfisher *Alcedo atthis* and swift *Apus apus*.

Field Survey Results

The site supports habitat suitable for breeding birds such as buildings (many of which are open stables), trees, hedgerows, scrub, dense ivy on the side of one of the barns (B3) and the adjacent reed habitat along the Lidsey Rife banks on the eastern site boundary. Species recorded during the various site visits include, blue tit *Parus caeruleus*, carrion crow *Corvus corone*, magpie *Pica pica*, green woodpecker *Picus viridis*, great spotted woodpecker *Dendrocopos major*, starling *Sturnus vulgaris*, robin and swallow *Hirundo rustica*. Pied wagtail *Motacilla alba* was also recorded during the 2020 updating walkover survey. Nesting house sparrow were recorded within The Lodge (B1) and swallow and robin were recorded nesting within the stable blocks (B4

and **B3**) during the initial survey in 2017. Starling and house sparrow are red listed species¹¹ of conservation concern.

The site is unsuitable for overwintering species of birds due the fact that the open fields are all actively grazed by horses and offer little in terms of foraging opportunities for birds; no other habitat on site is suitable for overwintering birds.

4.9.2 Evaluation

Breeding Birds

The site provides nesting opportunities for a range of bird species, including red listed starling and house sparrow within the buildings. Vegetated habitat for nesting and foraging opportunities is relatively limited on site and given the extent of suitable nesting habitat within the wider landscape, the habitat on site is assessed as being of value at the site level only.

4.10 Reptiles

4.10.1 Baseline Ecological Conditions

Desktop Study Results

SxBRC returned records for four species of reptile within the desktop study area: slow-worm *Anguis fragilis*, grass snake *Natrix natrix*, adder *Vipera berus* and common lizard *Zootoca vivipara*. Seven grass snake records were returned between 1991 and 2001 largely associated with the parish of Aldingbourne to the north-west of the site. A single record of adder from 1999, located within Westergate approximately 530 metres north-west of the site boundary. The data also included eight records of slow-worm and four records of common lizard, the most recent from 2016 for both species.

Field Survey Results

No reptiles were recorded during the initial survey or the updating walkover in 2020. The site provides a range of habitats with a diversity of structure suitable for this species group such as long grassland, the end of the rear garden of The Lodge (which is slightly overgrown), the banks of the Lidsey Rife and ruderal areas of vegetation likely to be used by slow-worm and possibly grass snake. However, the majority of the site is dominated by horse-graze fields which are not suitable. The 2020 updating walkover survey found that these habitats remain the same as in 2017.

¹¹ Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: The Population Status of Birds in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 108, 708–746.

4.10.2 Reptile Survey Results

During the seven survey visits carried out in 2017/2018, no reptiles were recorded at the site. During the 2021 reptiles surveys, a peak count of two female adult slow-worms and two adult grass snake were recorded.

4.10.3 Evaluation

Population Class Size Assessment

Table 15 shows the current guidance (Froglife, 1999) for assessing the population size of reptiles based on a refugia density of 10 per hectare.

Table 15: Criteria for population size assessment based upon a refugia density of 10 per hectare

Species	Low Population	Good Population	Exceptional Population
Slow-worm	<5	5-20	>20
Grass snake	<5	5-10	>10

Given the peak count of two adult slow-worm and two adult grass snake, the site is assessed as supporting a low population of slow-worm and a low population of grass snake.

Evaluation

While the site supports some suitable habitat for reptiles, the majority of the site is dominated by horse-grazed fields, buildings and hardstanding. As such, the site is unlikely to support an important population of this species group, particularly given the extent of suitable habitat in the wider area comprising hedgerow bases bounding fields and railway sidings to the north and the peak count of two adult slow-worm and two adult grass snake. For these reasons, on-site habitats are assessed as being of no more than site value to reptiles.

4.11 Great Crested Newt

4.11.1 Baseline Ecological Conditions

Desktop Study Results

SxBRC returned three records of great crested newt *Triturus cristatus*; one from 1992 and two from 2013 located near Hook Lane, Aldingbourne (north of the site) and within a pond 770 metres north-west of the site respectively. No granted EPSM licenses for great crested newt have been granted by Natural England within a two-kilometre radius of the site.

There are four waterbodies within 500 metres of the site, the nearest of which is located approximately 175 metres west on the edge of the A29 Lidsey Road, which is a main road. This is a drainage ditch likely to be associated with the A29 and although not surveyed as part of this study, is unlikely to provide suitability for great crested newt due to fluctuating water levels and pollution levels from road run-off; the ditch is separated from the site by the A29 Lidsey Road.

There are two further drainage ditches within proximity to the site, approximately 275 metres and 345 metres south which drain into the Lidsey Rife. Again, these were not assessed as part of the initial survey or the updating walkover in 2020 and could potentially provide suitable breeding habitat for great crested newt if the water is sufficiently deep and is not flowing. The habitat between these two ditches and the site comprises arable land and a static caravan site (sub-optimal terrestrial habitat for great crested newt). The third waterbody is a reservoir located approximately 386 metres south-east of the site. This is on the opposite side of the Lidsey Rife to the site and the flowing water of the Lidsey Rife would present a barrier to dispersal for this species, should they be present in this waterbody.

Field Survey Results

There are no standing waterbodies on site. Much of the site comprises grazed horse paddocks, buildings and hardstanding and is sub-optimal for this species during its terrestrial stage of life. The waterbodies within 500 metres of the site comprise drainage ditches (the nearest being 175 metres away) and a reservoir which are considered unlikely to support breeding populations of great crested newt. The likelihood of great crested newt commuting from these waterbodies to the site is very low considering the sub-optimal habitat of the site together with the sub-optimal habitat between the site and the waterbodies. As such, it is considered highly unlikely they would utilise the terrestrial habitat on site, considering that the majority comprises horse-grazed fields and hardstanding.

4.12 Invertebrates

4.12.1 Baseline Ecological Conditions

Desktop Study Results

Six records of stag beetle *Lucanus cervus* were returned by SxBRC, two from 1998, three from 2015 and one from 2019 from locations within the parish of Aldingbourne north of the site.

Field Survey Results

Habitats on site are likely to support a range of common invertebrate species but it is considered unlikely that any notable or rare species would be supported by the site due

to the horse-grazed paddocks, buildings and hardstanding which dominate the site. The features of most value for invertebrates are the mature trees scattered across the site, some of which are oaks which suitable for stag beetle at larval stage, and the riparian habitat associated with the Lidsey Rife adjacent to the eastern boundary. The 2020 updating walkover survey found that the mature oaks remain suitable for invertebrates. No log piles/decaying wood was recorded on site for developing stag beetle larvae to exploit.

4.12.2 Evaluation

The mature oak trees on site could support a diversity of invertebrates including stag beetle. The majority of the site comprises habitats that are common and widespread in the local area. As such, the invertebrates they support are unlikely to be notable, and if notable species are present such as stag beetle, the site is unlikely to form an important proportion of the available habitat. As such, on-site habitats are considered to be of value at site level only.

4.13 Other Relevant Species

4.13.1 Baseline Ecological Conditions

Desktop Study Results

A single record of European eel *Anguilla anguilla*, a Species of Principal Importance, from 2001 was returned by SxBRC. This record states the presence of 22 individuals, located in the sewage treatment works at Lidsey approximately 330 metres downstream south of the site boundary. A number of European hedgehog *Erinaceus europaeus* records, a Species of Principal Importance, were returned from locations in Aldingbourne north of the site.

Field Survey Results

European eel could be present within the Lidsey Rife on the eastern site boundary and also rely on this watercourse for commuting up/down stream. European hedgehog could utilise habitat on site, such as the areas of scrub, hedgerows and ruderal vegetation. At the time of the initial survey and the 2020 updating walkover survey, the site is unfenced and therefore allows free movement for species such as European hedgehog, within the landscape.

4.13.2 Evaluation

The presence of European hedgehog and eel has not been established; a value at site level is given to these species as a precaution considering the extent and nature of habitat suitable for these species within the wider landscape.

5.0 ASSESSMENT OF ECOLOGICAL EFFECTS AND MITIGATION/COMPENSATION/ENHANCEMENT MEASURES

5.1 Introduction

This section assesses the ecological effects of the proposed development scheme on the identified ecological features as identified in Section 4.0. Methods for addressing potential impacts on ecological features have been approached in accordance with the mitigation hierarchy¹² with avoidance of impacts prioritised where possible. Where significant adverse effects cannot be avoided other forms of mitigation are prioritised over-compensation. Enhancement measures have been detailed, where relevant, in order to not only minimise the impacts on biodiversity but also to provide enhancement in accordance with Paragraph 170 of the NPPF (Paragraph 2.2). It is anticipated that mitigation, compensation and enhancement measures will be secured through the planning process.

5.2 Scheme Design

The proposals are for the redevelopment of the site for a residential scheme comprising 180 units with associated gardens, car parking and amenity space.

The main access will be from Woodgate Road to the north-west, and the scheme will deliver a new link through from the A29, via Woodgate Road to the east of the site. A new lighting scheme will also form part of the proposals. Approximately 1.5 hectares at the eastern end of the site will be open green space with a mown footpath, planting and attenuation basin.

The potential ecological impacts and effects of these proposals, in the absence of mitigation, are described for each ecological feature below. For each ecological feature, measures to mitigate and/or compensate for significant effects are described.

5.3 Designated Sites

5.3.1 Potential Impacts and Effects

The nearest designated site is a considerable distance away (The Brookes LNR approximately 2.5 kilometres away). In addition, numerous fields, farms and small settlements are present between the development site and the LNR, and therefore it is unlikely to be affected by the proposals. There are no anticipated effects on any other designated sites within the study area.

The Annex II species barbastelle was recorded at the site; one of the species for which the Singleton and Cocking Tunnels SAC is designated. However, only 22 registrations

¹² In accordance with CIEEM Ecological Impact Assessment guidance (CIEEM, 2018) a sequential process is adopted to address impacts on features of ecological interest, with 'Avoidance' prioritised at the top of the hierarchy and Compensation/Enhancement' at the bottom. This is often referred to as the 'mitigation hierarchy'.

of barbastelle were recorded across the survey period (0.1% of all registrations at the site) suggesting the presence of a very low number of bats of that species. The site does not provide the optimum habitat for this species with only the species-poor defunct hedgerows present on site that is likely to be of interest to the bats for feeding. No boundary vegetation is due to be removed and the majority of mature trees and scrub will also be retained on site. As such, the development is unlikely to negatively impact foraging and commuting barbastelle.

5.3.2 Mitigation Measures

Given that no potential impacts on designated sites have been identified, no mitigation measures are considered necessary.

5.3.3 Significance of Residual Effects

No significant residual effects on designated sites are anticipated as a result of the proposals.

5.3.4 Compensation

No compensation measures are considered necessary.

5.3.5 Enhancement

The proposals will result in an improvement for barbastelle bats and other foraging and commuting bats at the site due to a net increase in foraging and commuting habitat. For example, the existing defunct hedgerow along the northern boundary will be reinforced with indigenous hedgerow species. This will form part of a two-metre wide buffer planting zone along the northern boundary which will enhance the site's habitat connectivity with the wider area.

In addition, the southern site boundary, currently not bordered by vegetation will be planted with the same native species hedgerow. This will result in a net increase of approximately 400 metres in linear habitat features on the site. New tree planting is also proposed, providing further foraging habitat for bats. Further details on these planting proposals are provided in Paragraph 5.4.5.

5.3.6 Monitoring

No future monitoring in relation to designated sites is proposed.

5.4 Habitats

5.4.1 Potential Impacts and Effects

There will be a loss of improved grassland approximately 4.5 hectares in size, a small number of scattered trees (although all high value existing oak trees will be retained), a short section of hedgerow (approximately 100 metres) areas of scrub, ruderal

vegetation, buildings and hardstanding. There is a risk that mature trees may become damaged during the construction phase due to use of machinery in close proximity and root compaction. There is also the possibility impacts of pollution and disturbance to the Lidsey Rife on the eastern site boundary during the construction phase.

5.4.2 Mitigation Measures

The mature scattered trees will be retained as part of any development proposals. All works will follow protective measures in line with BS 5837:2012 *Trees in Relation to Design, Demolition and Construction* (BSI, 2012). This document outlines the use of tree protection barriers to be used for the duration of the construction phase. These barriers are proposed to shield the mature trees from damage during construction.

A Construction Environmental Management Plan (CEMP), with input from an ecologist, will be submitted to the Local Planning Authority prior to any site preparation and construction works commencing. All ecological mitigation requirements in relation to the protection of habitats (in particular the Lidsey Rife) and species during the construction phase of the programme, will be included in this document. This would include measures such as control of surface run-off into the Lidsey Rife, prevention of dust and spills and safe storage of materials to ensure that no habitat degradation occurs further downstream.

5.4.3 Significance of Residual Effects

If the above mitigation measures are implemented, the proposals are unlikely to result in any significant residual effects on habitats.

5.4.4 Compensation

Landscaping proposals incorporated into the masterplan will compensate for the loss of on-site habitat.

Low level planting will include a mixture of flowering plants and shrubs, consisting of species that are known to benefit invertebrate species. It is acknowledged, however, as the landscaping proposals will largely be for residential use, some non-native species can also be beneficial such as verbena *Verbena bonariensis*, lavender *Lavandula* species and *Salvia* species.

Residential gardens will be sown with a native seed mix such as Emorsgate EL1 flowering lawn mixture for more well-managed area. This mixture contains slow-growing grasses with a selection of wildflowers that respond well to regular short mowing.

5.4.5 Enhancement

The eastern area to comprise open green space will be sown with Emorsgate EM3 Special General Purpose Meadow Mixture (or similar mix) containing a wide range of grass and wildflower species. Grassland will be managed in such a way that is beneficial to wildlife such as being cut selectively to varying grass heights.

A new attenuation basin is also due to be created in the north-eastern part of the site. This area will be sown with a seed mix that is based on traditional floodplain and water meadows, such as Emorsgate EM8 Meadow Mixture for Wetlands (or similar) as well as new marginal planting around the edge of the basin. Log piles and brash around the margins of the basin will provide cover for wildlife and the marginal areas of the pond will be designed with an undulating landform, providing a variety of water depths to further add diversity.

The existing defunct hedgerow along the northern boundary will be reinforced with indigenous hedgerow species such as holly *Hedera helix*, hawthorn *Crataegus monogyna*, hazel *Corylus avellana* and field maple *Acer campestre*. This will form part of a two-metre wide buffer planting zone along the northern boundary which will enhance the site's habitat connectivity with the wider area and provide habitat for a range of protected species. There will also be isolated sections of hedgerow throughout the site, bounding the spine road, private driveways and residential gardens.

In addition, the southern site boundary, currently not bordered by vegetation will be planted with the same native species hedgerow. This will result in a net increase of approximately 400 metres in linear habitat features on the site as well as resulting in an improvement in the quality of the habitat. These measures will increase connectivity while maintaining permeability for protected species across the site and will ensure accordance with Policy ENV DM5 of the Arun District Local Plan regarding Biodiversity Opportunity Areas and corridors.

New tree planting is proposed and will incorporate native species as opposed to cultivars such as oak, silver birch *Betula pendula*, willow *Salix* species and beech *Fagus sylvatica*.

5.4.6 Monitoring

As part of an Ecological Mitigation and Enhancement Strategy, monitoring with regards to the establishment of new habitats and management of existing habitats will take place.

5.5 Bats

5.5.1 Potential Impacts and Effects

A low status day roost of soprano pipistrelle was recorded as present within B3 in 2017, therefore in the absence of mitigation and compensation the proposals will result in the loss of a roost and the potential harm to roosting bats through demolition of this building, if the roost is still present. In the absence of compensation, the proposals also have the potential to result in direct loss of suitable foraging and commuting habitat for bats, fragmentation/degradation of habitat and long-term disturbance to foraging and commuting bats through the introduction of new lighting and increases in predation levels. All trees suitable for roosting are due to be retained as part of the proposals.

In England, bats and their habitat are fully protected under the Wildlife and Countryside Act 1981 through inclusion in Schedule 5. In addition, all bat species are protected under the Conservation of Habitats and Species Regulations 2017. Refer to **Appendix 3** for details.

5.5.2 Mitigation Measures

Due to the presence of a low status day roost of soprano pipistrelle within B3, a Natural England bat licence will need to be obtained prior to the proposed demolition works commencing. The data gathered during the roost characterisation surveys and the initial inspection will be incorporated into the licence application and will be used to devise an appropriate mitigation strategy.

The species protection provision of the Habitats Directive, as implemented by the Conservation (Natural Habitats etc.) Regulations 2017 contains three 'derogation tests' which must be applied by the Local Planning Authority at the Planning Application stage and by Natural England when deciding whether to grant a licence to a person carrying out an activity which would harm a European Protected Species. The three tests that must be met in order to successfully obtain a Natural England licence are as follows:

- The consented operation must be for 'preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment';
- There must be 'no satisfactory alternative'; and
- The action authorised 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.

In relation to the three derogation tests the following statements relate to B3 at the Woodgate Centre site:

Preserving Public Health and Safety or other Imperative Reasons of Overriding Public Interest

The Arun District Council Local Plan has a target of delivering at least 20,000 homes by 2031. In order to help achieve its target the site forms part of a large allocation in the Local Plan through Policy H SP2c for Barnham, Eastergate and Westergate.

No Satisfactory Alternative

The proposed works are required to increase the number of residential dwellings on site to contribute to the target of at least 20,000 homes delivered by 2031, as stated in the Arun District Council Local Plan. Constructing additional dwellings within the vicinity of the site would result in the loss of habitats which are of greater ecological value than on-site habitats including agricultural fields surrounded by hedgerow and treelines. Retained B3 on the site is not an option as space must be created for the construction of new dwellings.

Maintaining the Favourable Conservation Status of the Species at the Site

Given the presence of roosting bats within B3, the proposed works will result in the loss of the roost. The bat licence application will require the preparation of a clear and reasoned Method Statement which details the methods for maintaining the conservation status of the species at the site. This can be achieved by the following measures:

- All demolition works likely to disturb bats will be carried out during March to October, so as to minimise the impact on bat roosting locations;
- A toolbox talk will be given to contractors on site, and signage will be installed informing contractors of issues relating to bats and the redevelopment works;
- One bat box such as Vivara Pro Woodstone bat box or one of similar design will be erected on a retained tree prior to any demolition work taking place; this will remain in place at the site in perpetuity;
- Prior to any demolition works commencing at the site, the building will be inspected by a licensed bat worker to locate roosting bats. Any bats found during these inspections will, if necessary, be removed by hand and placed within bat box which has been previously erected on a tree within the site;

- To ensure that no bats are injured or maimed during the stripping and demolition works, the careful removal of all identified bat roost areas and suitable bat roosting features including areas of roof tiles, soffits, fascias and brickwork will be carried out by a licensed bat worker, using hand tools;
- All work to be carried out during the construction phase will be completed within daylight hours so as not to disturb potential roosting, foraging and commuting bats.

If roosting bats are recorded within additional buildings on site, or if roosts of a higher status are recorded, the above mitigation measures will be amended accordingly.

Mature trees suitable for roosting bats as well as boundary vegetation suitable for foraging and commuting are being retained and will continue to provide opportunities for roosting, foraging and commuting across the site. Implementation of a sensitive lighting scheme will ensure that dark corridors (less than one lux) are maintained across key areas of foraging and commuting habitat within and bordering the site such as the Lidsey Rife.

New external lighting will comprise hooded luminaires directed away from vegetation, particularly mature oak trees where possible. Ideally the bulbs will be LED and at the warmer end of the spectrum (e.g. avoiding blue or white light). LED lights emit much lower levels of UV and therefore have a lower impact on wildlife. The lighting on the outside of new buildings will be motion-activated and task related, associated with specific entrance/exit points. The lux level will be as low as possible to allow the task to be carried out safely and effectively. Guidance on task related lighting levels published by the Chartered Institution of Building Services Engineers (CIBSE) (CIBSE, 2002) will be followed. None of the areas in the vicinity of bat mitigation infrastructure will be directly illuminated. The majority of the Lidsey Rife will not be illuminated and will continue to be a commuting and foraging feature available to bats in the local area. Where lighting is necessary, this will be sensitively lit to reduce impacts on bats as much as possible.

5.5.3 Significance of Residual Effects

If the above mitigation measures are implemented, the proposals will not result in any significant residual effects on bats.

5.5.4 Compensation

New landscaping proposals described in Paragraph 5.4.5 will compensate for any net loss of habitat suitable for foraging and commuting bats at the site.

Low level planting will include a mixture of flowering plants and shrubs. Flowers should vary in colour to attract a wide variety of insects, pale flowers in particular attract insects at dusk. See Paragraph 5.4.4 for details of suggested species which are known to benefit invertebrate species that act as prey for bats.

5.5.5 Enhancement

New tree planting will incorporate native species as opposed to cultivars (see Paragraph 5.4.5). The eastern section of the site will be set aside for open green space. This will be sown with a species-rich grassland left to grow to varying grass heights and managed with selective cutting. This will provide habitat suitable for a range of invertebrates that bats species prey on.

The existing defunct hedgerow along the northern boundary will be reinforced with indigenous hedgerow species while new hedgerow planting will also be implemented along the southern boundary which will enhance the site's habitat connectivity for bats and provide improved commuting routes and foraging areas. Overall, there will be a net increase of approximately 400 metres in linear habitat features on the site, resulting in an enhancement for bats.

A selection of three bat boxes such as Vivara Pro Woodstone Bat Boxes, Improved Cavity Bat Boxes and/or Low Profile Woodstone Bat Boxes (or similar designs) will be erected on retained trees on the site. In addition, a single Build-In Woodstone Bat Box (or similar integrated design) will be installed into the fabric of each new dwelling. These measures will provide additional roosting opportunities for bats at the site.

5.5.6 Monitoring

No future monitoring of the site in relation to bats is proposed.

5.6 Badger

5.6.1 Potential Impacts and Effects

No direct evidence of badger has been recorded at the site to date, however the site does support habitat suitable for foraging. The proposals have the potential to result in minor losses of foraging habitat for badger. However, it is not considered that any local population would rely heavily on the site for foraging given the typical nature of the habitats present in the context of the wider area.

Badger are protected from killing and injury, and their setts protected from damage and interference, under the Protection of Badgers Act 1992. Refer to **Appendix 3** for details.

5.6.2 Mitigation Measures

Post-development, as few barriers to movement as possible will be installed around the perimeter of the site and within the site to ensure connectivity is retained between off-site and on-site habitat for badger. Where possible, the use of close board fencing will be limited.

5.6.3 Significance of Residual Effects

Given the negligible impacts of the proposals on badger, as identified above, no significant residual effects are anticipated.

5.6.4 Compensation

Given that the minor loss of habitat suitable for badger is assessed as a negligible impact, no compensation measures are considered necessary.

5.6.5 Enhancement

New shrub, hedgerow and tree planting described in Paragraphs 5.4.4 and 5.4.5 will provide additional habitat to be used by foraging badger at the site.

5.6.6 Monitoring

No future monitoring of the site in relation to badger is proposed.

5.7 Water Vole

5.7.1 Potential Impacts and Effects

In the absence of mitigation, it is possible that suitable water vole habitat and water vole individuals (including breeding females) within the Lidsey Rife may be impacted during the construction phase through disturbance, creation of dust and surface run-off. These activities may lead to possible pollution events, negatively impacting water vole and suitable water vole habitat. There will be no habitat loss or fragmentation in the long-term and there will be no change to water levels as a result of the proposals.

In England, water vole and their habitat are fully protected under the Wildlife and Countryside Act 1981 through inclusion in Schedule 5. Refer to **Appendix 3** for details.

5.7.2 Mitigation Measures

As described in Paragraph 5.4.2, a CEMP with input from an ecologist, will be submitted to the Local Planning Authority prior to any site preparation and construction works commencing. This would include measures to protect the Lidsey Rife during construction such as a suitable buffer zone between the toe of the bank and the construction area, control of surface run-off, prevention of dust and spills and safe storage of materials to ensure that no habitat degradation or impacts to water vole occurs.

5.7.3 Significance of Residual Effects

Assuming that the above mitigation measures are implemented, no residual impacts to water vole are anticipated.

5.7.4 Compensation

No compensation measures are required.

5.7.5 Enhancement

No enhancement measures in relation to water vole are proposed.

5.7.6 Monitoring

No future monitoring of the site in relation to water vole is proposed.

5.8 Birds

5.8.1 Potential Impacts and Effects

Demolition of the stable blocks (B3) will result in a loss of nesting sites for swallow, in particular, but also for other nesting birds. Vegetation removal has the potential to result in harm to nesting birds if undertaken during the nesting bird season (March to August) whilst the proposals have the potential to result in long-term losses to nesting habitat overall, in the absence of compensation.

All birds, their nests, eggs and young are legally protected, with certain exceptions, under the Wildlife and Countryside Act 1981 (as amended). Refer to **Appendix 3** for details.

5.8.2 Mitigation Measures

Demolition of buildings and clearance of vegetation will be undertaken outside of the nesting bird season of March to August to avoid harm/disturbance to nesting birds. If not possible, an ecologist will be present immediately prior to demolition/clearance to check for nesting birds. Any active nests will be left with a suitable buffer until nesting ends naturally and chicks have fledged.

5.8.3 Significance of Residual Effects

In the absence of compensation, there will be an overall net loss of habitat suitable for nesting birds as a result of the proposals.

5.8.4 Compensation

Replacement nesting opportunities for swallow and house sparrow will be provided within new dwellings to ensure no overall loss of nesting sites for these species. Eight House Sparrow Terrace FSC Nest Boxes (or similar) will be installed on new buildings across the site. The loss of swallow nesting sites will be mitigated for through the installation of three swallow nest cups in garages/bike sheds.

Suitable nesting habitat being lost will be replaced with woody native species as part of the landscaping proposals (see Paragraph 5.4.4).

5.8.5 Enhancement

New landscape, tree and hedgerow planting at the site as described in Paragraph 5.4.5 will result in an overall enhancement for breeding birds, providing an increase in natural habitat suitable for nesting.

Enhancement measures will also include the provision of five additional artificial nest boxes such as Vivara Pro Seville Woodstone Nest Box and/or Vivara Pro Barcelona Woodstone Open Nest Box (or similar designs). These will be installed on retained trees on the site.

5.8.6 Monitoring

No future monitoring of the site in relation to nesting birds is proposed.

5.9 Reptiles

5.9.1 Potential Impacts and Effects

Unmitigated, clearance of on-site habitat may result in the injury/killing of individual animals. In the absence of compensation, there will be a net loss in suitable reptile habitat on the site in the long-term.

Widespread reptile species (slow-worm, common lizard *Zootoca vivipara*, grass snake and adder) are protected under the Wildlife and Countryside Act 1981 against harm. Refer to **Appendix 3** for details.

5.9.2 Mitigation Measures

Given the low population of slow-worm and grass snake recorded to date (a peak count of two adult slow-worm and two adult grass snake) and the fact that the majority of the site supports horse-grazed fields that are unsuitable for reptiles, a full translocation exercise is not considered to be a proportionate approach. Instead, a precautionary destructive search will be undertaken to avoid harm to reptiles during clearance. This will involve the removal and excavation of suitable reptile habitat using a toothed bucket under the supervision of an ecologist, in suitable weather conditions between April and October inclusive, when reptiles are most active. Any reptiles encountered will be removed from the clearance area and allowed to disperse to the north or east of the site in areas which provide suitable habitat for the species group. It will be ensured that the site then remains unsuitable for reptiles for the duration of the construction phase so that it does not become recolonised.

5.9.3 Significance of Residual Effects

In the absence of compensation, there will be a net loss of habitat suitable for reptile as a result of the proposals.

5.9.4 Compensation

Low level planting and native grassland sowing within new residential gardens and hedgerow planting at site boundaries will compensate for the loss of a small amount of suitable reptile habitat on site (and enhance the site).

5.9.5 Enhancement

The site will be enhanced for reptiles through implementation of new hedgerow planting along the southern boundary and hedgerow reinforcement along the northern boundary (see Paragraph 5.4.5). New areas of grassland to the east and creation of log piles will also provide suitable foraging, sheltering and hibernating habitat for common species of reptile.

5.9.6 Monitoring

No future monitoring of the site in relation to reptiles is proposed.

5.10 Invertebrates

5.10.1 Potential Impacts and Effects

The features of most importance for invertebrates are likely to be the mature oak trees scattered across the site which could be suitable for stag beetle, and riparian habitat associated with the Lidsey Rife adjacent to the eastern boundary. These habitats are due to be retained as part of the proposals. Therefore, no impacts on invertebrates are anticipated.

5.10.2 Mitigation Measures

Given that there are no impacts anticipated on invertebrates, no mitigation measures are required.

5.10.3 Significance of Residual Effects

No significant residual effects are anticipated as a result of the proposals.

5.10.4 Compensation

No compensation measures are required in relation to invertebrates.

5.10.5 Enhancement

New low-level planting, new areas of grassland, tree planting and new hedgerows as described in Paragraphs 5.4.4 and 5.4.5 will result in an overall enhancement for invertebrates at the site.

In addition, four log piles will be created within the eastern section of open green space to create habitat suitable for stag beetle, amongst other invertebrate species.

5.10.6 Monitoring

No future monitoring of the site in relation to invertebrates is proposed.

5.11 Other Relevant Species

5.11.1 Potential Impacts and Effects

In the absence of compensation, the proposals will result in the loss of habitat suitable for European hedgehog with the removal of vegetation such as grassland, scrub and ruderal. There is also a risk that individuals may become harmed during vegetation clearance.

5.11.2 Mitigation Measures

A watching brief will be maintained during vegetation clearance to ensure harm to European hedgehog is avoided. Post-development, as few barriers to movement as possible will be installed around the perimeter of the site and within the site to ensure connectivity is retained between off-site and on-site habitat for European hedgehog. Where close board fencing is unavoidable, hedgehog holes will be created to maintain permeability for the species. These holes will measure 13 centimetres by 13 centimetres at ground level.

5.11.3 Significance of Residual Effects

Given the mitigation measures outlined above, no significant residual effects on European hedgehog are anticipated as a result of the proposals in the short-term. Without compensation, there will be a minor overall loss in habitat suitable for the species.

5.11.4 Compensation

New areas of grassland, shrub planting and creation of residential gardens will compensate for the loss of suitable habitat for European hedgehog, and result in an enhancement (see Paragraph 5.5.4).

5.11.5 Enhancement

The site will be enhanced for hedgehog through implementation of new hedgerow planting along the southern boundary and hedgerow reinforcement along the northern boundary (see Paragraph 5.4.5).

Habitat enhancements proposed in Paragraph 5.4.5 including new hedgerow planting, new areas of grassland to the east and creation of log piles will also provide suitability

for a range of species scoped out of the assessment such as common species of reptile, great crested newt and hazel dormouse.

5.11.6 Monitoring

No future monitoring of the site in relation to any other relevant species is proposed.

5.12 Cumulative Effects

Assuming that the mitigation and compensation measures outlined in the paragraphs above are implemented, no significant residual effects are anticipated. As such it is considered unlikely that the proposals will contribute to cumulative adverse effects in association with other proposals in the local area.

6.0 CONCLUSIONS

6.1 Conclusion

The site supports a low status day roost of soprano pipistrelle within one of the buildings and provides suitable habitat for foraging and commuting bats, badger, nesting birds, reptiles, invertebrates and European hedgehog. The Lidsey Rife supports a low population density of water vole.

Adverse impacts on these ecological features have been identified and mitigation and compensation measures have been recommended. Mitigation measures include the use of tree protection barriers, implementation of a CEMP, sensitive working methods of timings of work in relation to bats, birds and reptiles, while compensatory planting will replace habitat areas lost to the development.

Enhancement measures have been suggested in relation to bats through the installation of an additional bat roosting features in new buildings and bat boxes in trees; for birds through the provision of artificial nest boxes suitable for swallows and house sparrow and a range of other bird species, and for a range of other species through new landscaping, areas of grassland, tree and hedgerow planting.

Assuming the implementation of mitigation, compensation and enhancement measures stated in this report, it is considered that the proposals will accord with all relevant national and local planning policy in relation to ecology including the relevant policies within the Arun District Local Plan and the NPPF (see Section 2.0).

6.2 Updating Site Survey

If the planning application boundary changes or the proposals for the site alter, a re-assessment of the scheme in relation to ecology may be required. Given the mobility of animals and the potential for colonisation of the site over time, updating survey work may be required, particularly if development does not commence within 18 months of the date of the most recent relevant survey.

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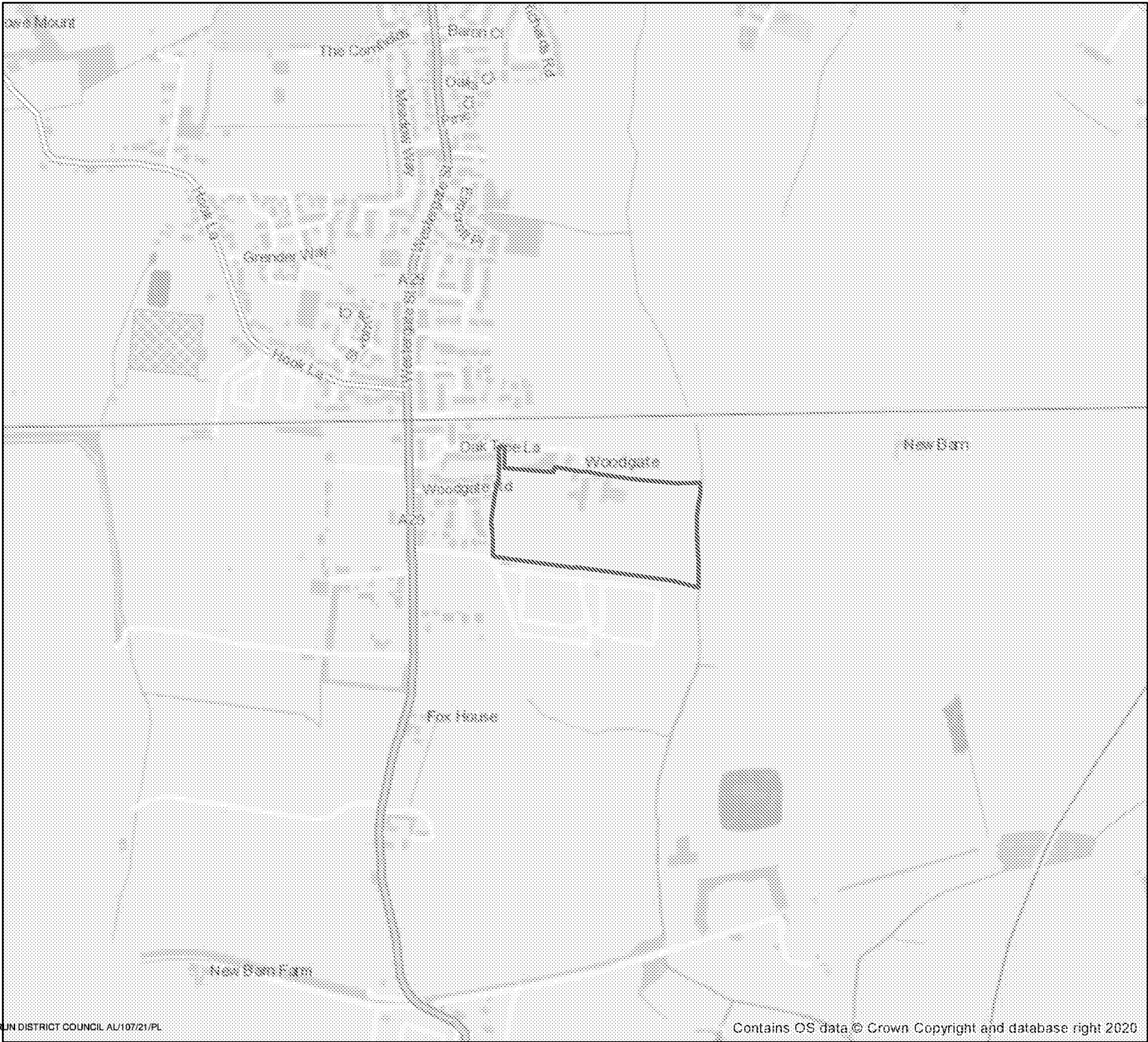
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Map 1 Site Location Plan



**WOODGATE CENTRE, WESTERGATE,
CHICHESTER, WEST SUSSEX**

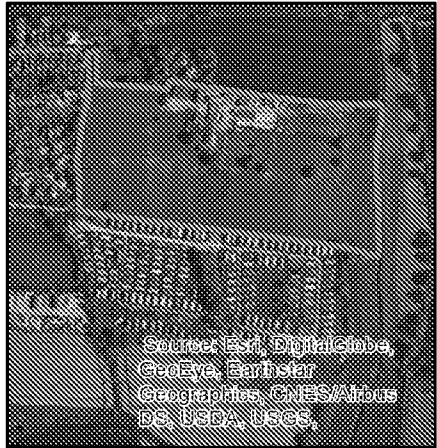
ECOLOGICAL IMPACT ASSESSMENT

Map 1 - Site Location Plan

Client:	Pye Homes
Date:	October 2021
Status:	Final

KEY

 Site Boundary



Scale at A4: 1:10,000
0 100 200 400 Metres



Prepared by: HB	Date: 090721
Last amended by: N/A	Date: N/A

ECOSA

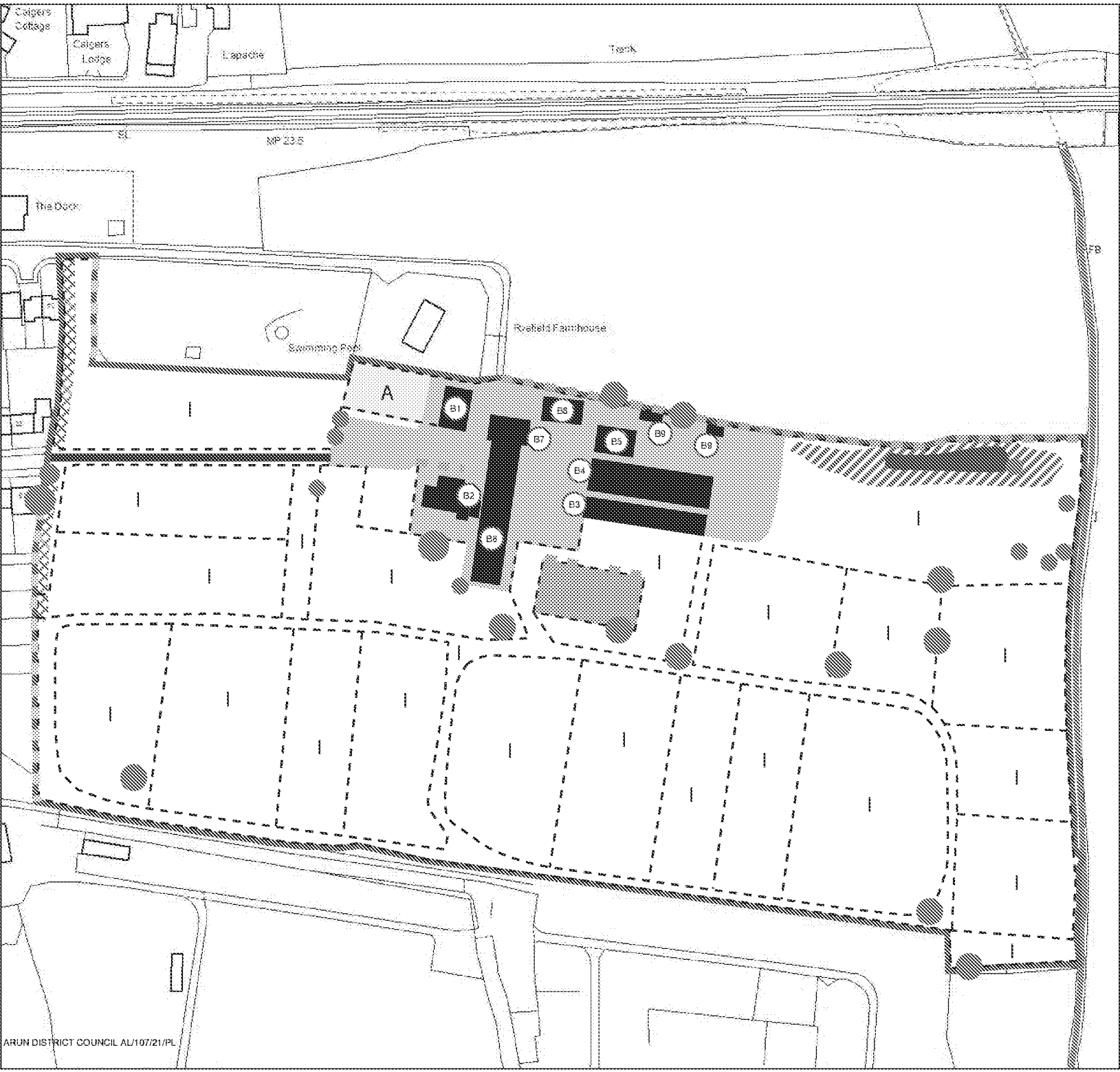
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Map 2 Phase 1 Habitat Map



**WOODGATE CENTRE, WESTERGATE,
WEST SUSSEX**

ECOLOGICAL IMPACT ASSESSMENT

Map 2 - Phase 1 Habitat Map

Client:	Pye Homes
Date:	October 2021
Status:	Final

KEY	
	Site Boundary
	Target Note
	Building Number
	Scattered Broadleaved Trees
	Dense/Continuous Scrub
	Improved Grassland
	Tall Ruderal
	Watercourse
	Amenity Grassland
	Defunct Species-Poor Hedge
	Hedgerow with Trees
	Buildings
	Hardstanding
	Menage
	Manure Heap
	Fence

Habitat features not to scale.

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Map 3 Ground Level Tree Assessment and Tree Climb and Inspect Survey



**WOODGATE CENTRE, WESTERGATE,
WEST SUSSEX,**

ECOLOGICAL IMPACT ASSESSMENT

**Map 3 - Ground Level Tree Assessment and
Tree Climb and Inspect Survey**

Client:	Pye Homes
Date:	October 2021
Status:	Final

KEY

- Not Climbed - High Suitability
- Not Climbed - Low Suitability
- ⊙ Not Climbed - Negligible Suitability
- ▲ Climbed - Low Suitability
- △ Climbed - Moderate Suitability
- ▲ Climbed - Negligible Suitability

N.B. The Ground Level Tree Assessment was carried out on 11th July 2018. A total of 22 trees were inspected during the survey, with a total of three identified as having high suitability and two with low suitability. Six trees were identified as requiring a further Tree Climb and Inspect survey. The Tree Climb and Inspect Survey was carried out on 20th August 2018. Two were found to have negligible suitability, three with low suitability and one with moderate suitability.

Scale at A4: 1:2,000
0 20 40 80 Metres

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Map 4 **Bat Emergence/Re-entry Survey**

Client:	Pye Homes
Date:	July 2021
Status:	Final

 Site Boundary
 Soprano pipistrelle *Pipistrellus pygmaeus* Re-entry

Bat emergence/re-entry surveys of the on-site buildings were undertaken between August 2017 and October 2018. During these surveys, a single soprano pipistrelle was recorded re-entering B3 on the 29th August 2017. As such, B3 is assessed as supporting a low status day roost of soprano pipistrelle.

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Map 5 Bat Transect Survey and Automated Detector Survey



WOODGATE CENTRE, WESTERGATE, WEST SUSSEX,

ECOLOGICAL IMPACT ASSESSMENT

Map 5 - Bat Transect and Automated Detector Survey

Client:	Pye Homes
Date:	October 2021
Status:	Final

KEY

-  Site Boundary
-  Bat Transect Route
-  Location of Automated Detectors

N.B. Bat Transect Surveys were undertaken between August and October 2017, April and June 2018 and April and October 2021. Two automated detectors were deployed in the same locations on seven occasions between August 2017 and August 2018. Seven automated detector surveys have been completed during the 2021 season.

Scale at A4: 1:2,100

0 20 40 80 Metres

N

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Map 6 Hazel Dormouse, Reptile, Otter and Water Vole Surveys



WOODGATE CENTRE, WESTERGATE, WEST SUSSEX,

ECOLOGICAL IMPACT ASSESSMENT

Map 6 - Hazel Dormouse, Reptile, Otter and Water Vole Survey

Client:	Pye Homes
Date:	October 2021
Status:	Final

KEY

-  Site Boundary
-  Location of Dormouse Tubes (x50)
-  Location of Reptile Refugia (x50)
-  Otter and Water Vole Survey Area
-  Slow-Worm x1 Adult
-  Grass Snake x2 Adult
-  Water Vole Burrow
-  Water Vole Latrine

Scale at A4: 1:2,500
0 25 50 100 Metres



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Appendix 1 Site Proposals Plan



ACCOMMODATION SCHEDULE		
Private Dwellings		
No.	Dwelling Type	Size
27no.	1-bedroom Apartments	50sqm
4no.	2-Bed 4 Person Flat	75sqm
2no.	3-Bed 5 Person Bungalow	Type B 80sqm
2no.	3-Bed 5 Person Bungalow	Type C 85sqm
6no.	2-Bed 4 Person Cottage House	Type D 75sqm
27no.	2-Bed 4 Person Semi Detached	Type E2 70sqm
4no.	3-Bed 5 Person Corner Semi Detached	Type F 100sqm
4no.	3-Bed 5 Person Detached House	Type G 95sqm
4no.	3-Bed 5 Person Semi Detached	Type H1 95sqm
8no.	3-Bed 5 Person Detached House	Type J 95sqm
4no.	3-Bed 5 Person Semi Detached	Type M 95sqm
3no.	3-Bed 5 Person Cottage	Type U 95sqm
10no.	3-Bed 5 Person Semi Detached	Type S 100sqm
8no.	4-Bed 7 Person Detached House	Type T 115sqm
1no.	4-Bed 7 Person Detached House	Type L 127sqm
8no.	4-Bed 8 Person Detached House	Type R 140sqm
3no.	Kingston - 4-Bed 8 Person Detached House	132sqm
1no.	Southdown - 4-Bed 8 Person Detached House	140sqm
2no.	Southdown - 4-Bed 8 Person Detached House	215sqm
Total		123 Dwellings (70%)
Affordable Dwellings		
No.	Dwelling Type	Size
3no.	1-bedroom Apartments	50sqm
2no.	2-Bed 4 Person F2Q2	75sqm
14no.	3-Bed 5 Person Semi Detached	Type C1 70sqm
2no.	3-Bed 5 Person Semi Detached	Type S 100sqm
4no.	4-Bed 6 Person Semi Detached House	Type K 115sqm
Total		34 Dwellings (20%)
Totals		
Total		157 Dwellings
M4(2)		
Dwelling Mix compliant. Out of the total population, 52 dwellings are M4(2) compliant equalling to 28%.		
Car Parking - generally:		
1no. spaces per 1-bedroom Flat		
2no. spaces per 2-bedroom F2Q2		
2no. spaces per 3-bedroom F2Q2		
2no. spaces per 4-bedroom F2Q2		
2no. spaces per 5-bedroom F2Q2		
2no. spaces per 6-bedroom F2Q2		
2no. spaces per 7-bedroom F2Q2		
2no. spaces per 8-bedroom F2Q2		
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Appendix 2 Sites Designated for Nature Conservation

Statutory Sites

Internationally Designated Sites - Ramsar Sites, Special Areas of Conservation and Special Protection Areas

Special Protection Areas (SPA) and Special Areas of Conservation (SAC) form a network of protected sites across the European Union called Natura 2000 sites. In the United Kingdom the primary legislative protection is afforded to these sites under the Conservation of Habitats and Species Regulations 2017 (as amended).

Ramsar sites are designated as wetlands of international importance which are afforded similar legislative protection to Natura 2000 sites.

SACs are sites which support intentionally important habitats or internationally important assemblages or populations of species. SPAs are designated for supporting internationally important populations of birds listed in the annexes of the Birds Directive. SACs, SPAs and Ramsar sites are generally also designated as Sites of Special Scientific Interest.

Under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended) there is a legal requirement that competent authorities, such as local planning authorities, need to consider whether plans or projects are likely to have a significant adverse effect on Natura 2000 sites or Ramsar sites, either alone, or in combination with other plans or projects. In the event that a likely significant effect cannot be ruled out, on the basis of objective information, then the competent authority must undertake an “Appropriate Assessment” to fully assess the plan or project against the site’s conservation objectives. Unless certain defined derogation tests can be met, the competent authority may not authorise nor undertake any plan or project which adversely affects the integrity of a Natura 2000 site or Ramsar site.

Nationally Designated Sites – Sites of Special Scientific Interest and National Nature Reserves

Sites of Special Scientific Interest (SSSI) receive legal protection under the Wildlife and Countryside Act 1981 (as amended). Such sites are designated to protect specific areas of biological or geological interest of national importance. Such sites also generally receive strict protection through the planning system.

National Nature Reserves (NNR) are also usually designated as SSSIs and are specifically managed for their wildlife value. They receive legal protection through the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 (as amended). As with SSSIs, these sites generally receive strict protection through the planning system.

Locally Designated Sites – Local Nature Reserves

Local Nature Reserves (LNR) are designated by local authorities under the National Park and Access to the Countryside Act 1949. These are generally designated not only for their local wildlife value but also for education, scientific and recreational purposes. These sites generally receive protection from development through the planning system.

Appendix 3 Relevant Legislation

Bats

All UK bat species are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017. They are afforded full protection under Section 9(4) of the Act and Regulation 43 of the Regulations. These make it an offence to:

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb any such animal, including in particular any disturbance which is likely:
- To impair its ability to survive, breed, or rear or nurture their young;
- To impair its ability to hibernate or migrate;
- To affect significantly the local distribution or abundance of that species;
- Damage or destroy a breeding site or resting place of any such animal;
- Intentionally or recklessly disturb any of these animals while it is occupying a structure or place that it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any place that any of these animals uses for shelter or protection.

In addition, five British bat species are listed on Annex II of the Habitats Directive. These are:

- Greater horseshoe bat *Rhinolophus ferrumequinum*;
- Lesser horseshoe bat *Rhinolophus hipposideros*;
- Bechstein's bat *Myotis bechsteinii*;
- Barbastelle *Barbastella barbastellus*; and
- Greater mouse-eared bat *Myotis myotis*.

In certain circumstances where these species are found the Directive requires the designation of Special Areas of Conservation (SACs) by EC member states to ensure that their populations are maintained at a favourable conservation status. Outside SACs, the level of legal protection that these species receive is the same as for other bat species.

Dormouse, Otter and Great Crested Newt

These species are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017. They are afforded full protection under Section 9(4) of the Act and Regulation 43 of the Regulations. These make it an offence to:

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb any such animal, including in particular any disturbance which is likely, to impair its ability to survive, breed, or rear or nurture their young, to impair its ability to hibernate or migrate;
- To affect significantly the local distribution or abundance of that species;
- Damage or destroy a breeding site or resting place of any such animal;
- Intentionally or recklessly disturb any of these animals while it is occupying a structure or place that it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any place that any one of these species uses for shelter or protection.

Badger

The Protection of Badgers Act 1992 consolidates previous legislation (including the Badgers Acts 1973 and 1991 Badgers (Further Protection) Act 1991). It makes it an offence to:

- Kill, injure or take a badger;
- Attempt to kill, injure or take a badger; or
- To damage or interfere with a sett.

The 1992 Act defines a badger sett as 'any structure or place which displays signs indicating current use by a badger'.

Water vole

The water vole is listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is afforded limited protection under Section 9 of this Act. This makes it an offence to:

- Intentionally kill, injure, or take (handle) a water vole;
- Intentionally or recklessly damage or destroy or obstruct access to any structure or place which water voles use for shelter or protection; or
- Intentionally or recklessly disturb water voles while they are using such a place.

Breeding Birds

With certain exceptions, all wild birds, their nests and eggs are protected by Section 1 of the Wildlife and Countryside Act 1981 (as amended). Therefore, it is an offence, to:

- Intentionally kill, injure or take any wild bird;
- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; or
- Intentionally take or destroy the egg of any wild bird.

These offences do not apply to hunting of birds listed in Schedule 2 subject to various controls. Bird species listed on Schedule 1 of the Act receive further protection, thus for these species it is also an offence to:

- Intentionally or recklessly disturb any bird while it is nest building, or is at a nest containing eggs or young; or
- Intentionally or recklessly disturb the dependent young of any such bird.

Reptiles

The four widespread species of reptile that are native to Britain, namely common or viviparous lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, adder *Vipera berus* and grass snake *Natrix natrix*, are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are afforded limited protection under Section 9 of this Act. This makes it an offence to:

- Intentionally kill or injure any of these species.

The remaining native species of British reptile (sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*) receive a higher level of protection via inclusion under Schedule 2 of the Conservation of Habitats and Species Regulations 2017. They are afforded full protection under Section 9(4) of the Act and Regulation 43 of the Regulations (in England and Wales only) and the Wildlife and Countryside Act 1981 (as amended). The distribution of these species are restricted to only a few sites in England.

Species of Principal Importance in England

The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The England Biodiversity List is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the NERC Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions. There are currently 943 species of principal importance included on the England Biodiversity List.

Appendix 4 Protected and Notable Species Appraisal Methods

Bats

The survey conformed to current Bat Conservation Trust guidelines (Collins, 2016). An assessment was made of the suitability of buildings and trees on the site and immediately on the site boundary to support roosting bats based on the presence of features such as loose or missing roof tiles or lifted lead flashing for buildings and holes, cracks, splits, loose bark and ivy cladding for trees. A detailed external and internal inspection of accessible structures was undertaken to compile information on potential and actual bat entry/exit points; potential and actual bat roosting locations; any evidence of bats found.

An assessment was made of the suitability of the site and the surrounding landscape to support foraging and/or commuting bat species. The assessment of the potential for the site to support roosting, foraging and commuting bat is based on a four-point scale as detailed in **Appendix 5**.

Otter

The otter appraisal was based on an assessment of the suitability of the habitat present within the site to support otter by reference to habitat type (such as rivers, streams, ditches, wetlands, reed beds, lakes, ponds and reservoirs), proximity of the site to freshwater and potential important feeding resources (such as fisheries), presence of habitat features which could provide opportunities for resting places and/or holts (such as tunnels, hollows at the base of trees and presence of dense, undisturbed habitat). During the survey attention was paid to the presence of evidence such as spraints, feeding remains, footprints and slides.

Badger

The survey involved a detailed investigation of the site to identify evidence of badger residence, foraging or territorial activity. Particular emphasis was placed on locating badger setts, paths, and signs of territorial activity such as latrine sites both on-site and within immediately adjacent areas where access was possible.

Hazel Dormouse

The appraisal for the potential of the site to support dormouse was based on an assessment of habitat features that may indicate that the species is present. This includes the presence of key food sources such as hazel and bramble, or plants used as nesting material such as honeysuckle and clematis. Additionally, the species requires a continuum of food supply so that habitat structure, diversity and connectivity to adjacent areas of woodland/scrub are important features in determining the potential presence of hazel dormouse.

Water Vole

The water vole appraisal was based on an assessment of the suitability of the habitat present within the site to support water vole by reference to habitat type (such as rivers, streams, ditches, wetlands, reed beds, lakes, ponds and reservoirs), bank structure and the bank side

vegetation. Water voles generally require sloping banks in which to burrow and well-developed bank side vegetation to provide shelter and food. During the survey attention was paid to the presence of burrows, latrines, feeding remains, trails and footprints.

Birds

The appraisal of breeding birds on the site was based on the suitability of habitat present to support nesting bird communities, the presence of bird species that may potentially nest within the available habitat and evidence of nesting such as old or currently active nests.

The assessment of wintering birds was based on an assessment of the suitability of the habitat on site to support important wintering bird species and populations. Particular attention was paid to the potential for the site to support wintering farmland bird species, waders and wildfowl.

Reptiles

The reptile appraisal was based on an assessment of the suitability of the habitat present within the site to support a population of reptiles. Reptiles particularly favour scrub and rough grassland interfaces and the presence of these is a good indication that reptiles may be present on-site. In addition, reptiles may utilise features such as bare ground for basking, tussocky grassland for shelter and compost heaps and rubble piles for breeding and/or hibernating.

Great Crested Newt

The appraisal of the site to support great crested newt included establishing the presence of suitable aquatic habitats such as ponds, lakes or other waterbodies within or adjacent to the site and the presence of suitable terrestrial habitat. Waterbodies that are densely shaded, highly eutrophic or that contain fish are likely to be less suitable for this species. The suitability of on-site ponds and terrestrial habitat is considered in relation to the presence of ponds within the wider area, as identified within the desktop study (Paragraph 3.4.3), and their suitability to be used as a network.

Invertebrates

An assessment was made of the site for its potential value to support diverse communities of invertebrates. The assessment was based on the presence of habitat features which may support important invertebrate communities. These features include, for example, an abundance of dead wood, the presence of diverse plant communities, varied woodland structure, sunny woodland edges with a diverse flora, waterbodies and water courses and areas of free draining soil exposures. During the field survey there was no attempt made to identify species present as this is a more specialist area of ecological assessment reserved for targeted surveys.

Other Relevant Species

An assessment was made of site suitability for other notable species such as more rarely encountered protected species, Species of Principal Importance for the Conservation of diversity in England notified under Section 41 of the NERC Act 2006 and as listed in the England

Biodiversity List, and Local Biodiversity Action Plan (LBAP) species¹³, specific to the study region.

Invasive Species

During the field survey any incidental records of invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded. However, it should be considered that the survey was not specifically aimed at assessing the presence of these species and further specialist advice may need to be sought.

Appendix 5 Appraisal Criteria for Bats

The criteria used to assess the suitability of roosting and foraging/commuting habitat for bats is based on industry guidelines and outlined in **Table 16**¹⁴.

Table 16: Criteria used to Assess Suitability of Roosting and Foraging/Commuting Habitat for Bats

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

¹³ LBAPs identify local priorities for biodiversity conservation by translating national targets for species into effective action at the local level and identifying targets for species important to the local area.

¹⁴ Table adapted from (Collins, 2016)

	seen with only very limited roosting potential.	
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.

Appendix 6 Assessment Criteria for Roosting Bats

Roost types have been defined in accordance with Natural England and Bat Conservation Trust guidelines. Definitions are set out in **Table 17**.

Table 17: Bat roost types as defined by Natural England and the Bat Conservation Trust

Roost Type	Definition
Day Roost	A place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.
Night Roost	A place where bats rest or shelter in the night but are rarely found in the day. May be used by a single individual on occasion or it could be used regularly by the whole colony.
Feeding Roost	A place where individual bats or a few individuals rest or feed during the night but are rarely present by day.
Transitional/Occasional Roost	Used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.
Swarming Site	Where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites.
Mating Sites	Where mating takes place from late summer and can continue through winter.
Maternity Roost	Where female bats give birth and raise their young to independence.
Hibernation Roost	Where bats may be found individually or together during winter. They have a constant cool temperature and high humidity.
Satellite Roost	An alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season.

Appendix 7 Automated Detector Settings

Automated Detector Settings

Automated detectors can be calibrated in a number of different settings which can result in the potential variations in the way that bat calls are recorded. **Table 18** details the standard settings used by ECOSA during automated detector surveys undertaken.

Table 18: Standard automated detector settings

Option	Basic Setup
Settings - Audio	
Sample rate	192000Khz
Channels	Mono L (left)
Compression	WAV
Gain Left	+0.00
Gain Right	+0.00
Settings - Audio Advanced	
Dig High Pass Filter (HPF) Left	Fs/12
Dig High Pass Filter (HPF) Right	Off
Digital Low Pass Filter (LPF) Left	Off
Digital Low Pass Filter (LPF) Right	Off
Trig Lvl Left	12SNR
Trig Lvl Right	Off
Trg Win Left	2.0s
Trg Win Right	2.0s
Trg Max Length	2s
Bits (Div Ratio)	16
Nap Trg Lvl	Off

Data Conversion Settings

In order to analyse the data efficiently the raw .wav files recorded on the automated detector are subsequently converted to zero crossing (.zc) files which are subject to automated classification by Wildlife Acoustics Kaleidoscope Pro. During the conversion process the data is filtered to remove noise files in line with Wildlife Acoustics recommended setting as provided in **Table 19**.

Table 19: Noise file filtering settings

Option	Basic Setup
Signal of Interest – Frequency	8 – 120 kHz
Signal of Interest – Call Length	2 - 500ms
Signal of Interest – Minimum Number of Calls	2
Advanced Signal Enhancement	On

All filtered noise files are kept and subsequently assessed for bat calls in order to ensure that no bat calls have been incorrectly classified as noise. The “Advanced Signal Enhancement” setting discards files which Kaleidoscope assessed as being insufficient quality. Any discarded files are subsequently not stored by Kaleidoscope and therefore, not subject to analysis by an ecologist.

Appendix 8 Statutory Designated Sites within the Desktop Study Area

Details of statutory designated sites within the desktop study area, as listed in Paragraph 4.2.1, are provided in **Table 20**.

Table 20: Statutory Designated Sites Located Within the Desktop Study Area

Designation	Name	Approximate Relative Location	Reason for Designation
LNR	The Brooks	2.5 kilometres north	The site is designated for supporting a range of habitats including meadows, narrow reedbeds and ditches, permanent and temporary ponds, and an extensive newly planted floodplain woodland. The Brooks floods every winter, making it a good place for wetland wildlife.
SSSI	Halnaker Chalk Pit	4.5 kilometres north	The site consists of a partly vegetated pit in the Upper Chalk with peripheral areas of scrub and woodland. Halnaker Chalk Pit is important as the joint location of the largest population of a nationally rare plant species in Great Britain. This site is most significant for its population of the nationally rare and vulnerable broad-leaved cudweed <i>Filago pyramidata</i> with 10,000 plants (1990 figures) comprising approximately 50% of the total British population. This plant is typically found as a cornfield flower but as a result of modern agricultural practice has been almost extirpated. However the chalk pit provides a sufficiently suitable habitat for the plant to reach a height of a few centimetres and seed freely. Other flowering plant species found on the pit floor include wild basil <i>Clinopodium vulgare</i> and wild parsnip <i>Pastinaca sativa</i> .
SSSI	Felpham	4.7 kilometres north	A new Palaeocene aged flora, one of only three known in the country, has recently been discovered in the Reading Beds at this site. This assemblage of seeds and fruits is the most diverse known from these Palaeocene strata. Four new genera, unique in the world's Tertiary deposits, and sixteen new species have yet to be described from Felpham. In addition to seeds and fruits, fern fronds, palm stems and leaf fragments also occur. An outstanding site unusual for its variety of preservational states and unique floral assemblage.
SSSI	Eartham Pit – Boxgrove	5 kilometres north	The site is located at the northern edge of the West Sussex Upper Coastal Plain, an area that has undergone considerable geological and archaeological investigations. Immediately to the north of the pit there is a fossil shoreline, seen as a buried cliff, and deposited against this is a complex succession of intertidal and terrestrial sediments which represent a number of different climatic events.