
Ansty Garden Community

Environmental Statement

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APPENDIX G: ECOLOGY AND BIODIVERSITY

Appendix G1: Ansty Garden Community EcIA



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Ecological Impact Assessment

Ansty, Haywards Heath

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Ansty, Haywards Heath – ECOLOGICAL IMPACT ASSESSMENT

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Report Summary

1. The Ecology Co-op has been commissioned by Fairfax Acquisitions Ltd to undertake an Ecological Impact Assessment of a proposed development on land east of Ansty, Haywards Heath. Following a Preliminary Ecological Appraisal, including UKHab mapping, of the site by The Ecology Co-op in 2019, further ecological surveys were undertaken – including protected species surveys and desk-top studies in 2022/2023 – in order to provide sufficient baseline information for this assessment. This document presents the findings of these surveys and a full Ecological Impact Assessment in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines to inform a planning application to create a new residential community, complete with up to 1,363 houses, a school and a community centre.

2. The site is approximately 98ha in area and is predominantly in use as arable farmland, comprising 12 different habitat types, including arable fields, woodland, grassland, species-rich hedgerows, standing water and running water.

3. The phase 2 surveys found that the site supports:

- a variety of habitats with some notable plant communities including ancient woodland indicators and species associated with arable field margins;
- [REDACTED]
- roosting and foraging bats including notable species (barbastelle, serotine, Nathusius' pipistrelle, Alcaho, whiskered and Brandt's myotis);
- a total of 59 bird species, including nine red listed species and 13 species listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act or Schedule 1 of the Wildlife and Countryside Act;
- a population of dormice;
- a small population of great crested newts;
- common toads, although no targeted surveys have been undertaken;
- a large population of grass snake;
- An assemblage of fairly common aquatic invertebrates which indicate a relatively healthy watercourse.

4. The proposed development has been designed to avoid losses to natural habitats on site where possible; however there will be an unavoidable small loss of woodland, grassland, arable margin, hedgerow and scrub. There is also potential for indirect impacts to significantly affect retained habitats through increased recreational pressure and the potential for pollution. The following measures will be implemented to avoid, mitigate and compensate for these significant effects:

- nearby designated sites: creation of alternative green space and financial contribution to the relevant authority;
- priority habitats on site: industry standard construction methods; installation of heras fencing to demarcate buffer zones and protect habitat during the



construction phase; planting of a graded ecotone around retained woodland – all ancient woodland will be fenced to prevent public access; monitoring of all habitats on site in perpetuity and measures put in place where necessary to ensure no degradation of condition; replacement of all habitat lost to the proposed development through a Biodiversity Net Gain scheme;

- [REDACTED]
- bats: ecologically sensitive lighting scheme to include no light zones and dark corridors, precautionary felling methodology and European Protected Species (EPS) licence where required, installation of bat roost features;
- breeding birds: works/removal of suitable vegetation to be timed outside the nesting bird season, heras fencing installation to protect habitats from accidental damage during the construction phase, installation of bird boxes;
- dormice: mitigation for direct impacts covered by EPS licence, biodiversity enhancements incorporated into soft landscape scheme including enhancement of woodland on-site, ecologically sensitive lighting design, installation of dormouse boxes;
- great crested newt and common toad: precautionary approach to construction methods – to be set out in an EPS licence for great crested newts;
- reptiles: precautionary approach to construction methods – reasonable avoidance measures and habitat manipulation, and the creation of a landscape and management plan for the proposed Parkland Reserve north-west of the site, which will include provision for reptiles, including targeted measures for grass snake;
- European hedgehog: all new garden fencing will contain accessible gaps (10cm x 15cm) at their base to allow movement of hedgehogs between garden plots;
- invasive non-native species: adoption of a native planting scheme, and removal of existing rhododendron and cherry laurel, to prevent the further spread of these species. All specimens will be removed and disposed of following strict invasive species protocol.

5. In line with the National Planning Policy Framework and the requirements of the Environment Act 2021, the site's ecological value will be enhanced by a minimum of 10% net gain in biodiversity value – to be detailed within a separate Biodiversity Impact Calculation Report.



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1 INTRODUCTION

1.1 Background

The Ecology Co-op was commissioned by Fairfax Acquisitions Ltd to undertake an Ecological Appraisal of land at Ansty, Haywards Heath RH17 5AF. This report presents the findings of baseline ecological surveys and desk-study research, and assesses the likely impacts and significance of effects of the proposed development in relation to protected/notable species, habitats and designated sites.

The site is located on the outskirts of Haywards Heath, south-west of Cuckfield. The central grid reference for the site is TQ 29692 23307. Figure 1 shows the boundary of the site and local context.

The site measures approximately 98 hectares (ha) and is predominantly in use as arable farmland, comprising 12 different habitat types, including arable fields, woodland, grassland, species-rich hedgerows, standing water and running water.

There is a proposal to develop the site to create a new residential community, with up to 1,363 houses, a school and a community centre. The exact scale and layout of the proposed development has yet to be finalised at the time this document was prepared, but a draft plan is provided in Figure 2.

The Ecology Co-op undertook a Preliminary Ecological Appraisal (PEA)¹ of the site in February 2019. Based on the findings of this assessment, and following updated proposals concerning the scale of the proposed development, the following surveys were recommended:

- extended botanical survey
- bat surveys, including trees, buildings and activity surveys
- breeding bird surveys
- dormouse *Muscardinus avellanarius* presence/likely absence surveys
- great crested newt *Triturus cristatus* presence/likely absence surveys
- reptile presence/likely absence surveys
- badger *Meles meles* presence/likely absence surveys
- otter *Lutra lutra* presence/likely absence surveys
- bryophyte and invertebrate surveys of Copyhold Stream, which runs through the site.

1.2 Purpose of this Report

The Ecology Co-op undertook all of the above surveys across 2022 and 2023. The purpose of this report is to:

- present the findings of surveys and desk-study research (baseline ecological information);
- identify and evaluate the most ecologically important features present on the site and within the

¹ The Ecology Co-op (2019) *Preliminary Ecological Appraisal and Phase 1 Habitat Survey, Area C, Ansty Farm*.



- zone of influence of the proposed development;
- describe the impacts of the proposed development and determine the significance of effects on these ecologically important features;
- set out the proposed impact avoidance, mitigation, compensation measures that will be undertaken to reduce significant adverse effects to an acceptable level.
- outline the habitat creation and enhancement measures that will be put into place as part of the proposed development. These are designed to ensure that the proposals contribute to both local and national biodiversity objectives.

This report is intended for submission as part of the planning application for the proposed development and will be updated with the results of the stream surveys as soon as they are complete.

The surveys and this report production has been overseen by Paul Whitby, BSc, MCIEEM, CEcol.

1.3 Policy and Legislation

Legal protection applying to relevant bird, mammal, herpetofauna and invertebrate species and current nature conservation planning policy is outlined in Appendix 1 of this report.

Where possible, this report provides information on how the development proposal will be designed to meet the requirements of both the National Planning Policy Framework (NPPF) and local planning policy. Details of the NPPF and relevant local planning policy by Mid Sussex District Council is provided in Appendix 1.



Figure 1. An aerial image showing the location of the site. The approximate site boundary is outlined in red. Image produced courtesy of Google maps (map data ©2022 Google).



Figure 2. A draft concept sketch plan. Image produced by fabrik ltd, drawing D3012-FAB-00-XX-DR-Y-009, dated March 2023.



2 SURVEY METHODOLOGY

The following sections describe the methods used in the desk study and protected species/habitat survey(s). All survey methods are in accordance with current best practice guidance for the respective species/taxonomic group and any limitations encountered during the survey are explained in section 2.13.

This document is written in accordance with the CIEEM Guidelines for Ecological Impact Assessment² and CIEEM Guidelines for Ecological Report Writing³ Details of the ecological assessment methods are provided within section 2.12 below.

2.1 Desk Studies

A search for pre-existing records of protected species, priority species for conservation and invasive non-native species was requested from the Sussex Biodiversity Records Centre (SxBRC) within a radius of 2 km of the site boundaries.

A search of on-line mapping resources was undertaken to identify the location of any features of potential ecological interest including ponds within 500 m (relevant to great crested newts *Triturus cristatus*), watercourses (relevant to riparian mammals and crayfish for example) and connectivity to woodland, scrub, and hedgerow networks (relevant to bats and dormice for example) in the wider landscape around the site. The connectivity of the site to these features, buildings and other semi-natural habitats are also relevant to species such as bats, great crested newts and reptiles.

The MAGIC website resource (www.magic.gov.uk) was used to identify the location of designated sites for nature conservation and European Protected Species (EPS) licences granted in relation to the survey site.

2.2 Habitat Survey

An extended site walkover survey was undertaken in the week commencing 13th June 2022, during which the habitats contained within the site were described and evaluated in accordance with standard UK Habitat Classification (UKHab)⁴. The dominant species and indicators of important habitat types such as ancient woodland or unimproved grassland, were recorded and the condition of the habitats was evaluated according to Biodiversity Metric 3.1 Habitat Condition Assessment.

UKHab survey presents a standardised system for classifying and mapping wildlife habitats in all parts of Great Britain, including urban areas. The aim of the survey is to provide, relatively rapidly, a record of the vegetation and wildlife habitats present over large areas of countryside. The habitat classification is based principally on vegetation, augmented by reference to topographic and substrate features,

² CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

³ CIEEM (2017) *Guidelines for Ecological Report Writing, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester.

⁴ The UK Habitat Classification Working Group (2018) *The UK Habitat Classification User Manual* at <http://ecountability.co.uk/ukhabworkinggroup-ukhab>



particularly where vegetation is not the dominant component of the habitat.

The results of the survey are presented as a map showing the distribution of habitat categories across the site. Target notes are used to describe specific features of biodiversity interest and record indicator species where appropriate. In addition to this, notable habitats, such as habitats listed under the NERC Act, 2006 are highlighted.

The UKHab methodology is a recognised tool for initial scoping of potential ecological constraints and opportunities, and for identifying potential effects of the proposed development as part of the planning application process.

As part of the Preliminary Ecological Appraisal, the site features were evaluated for their potential to support legally protected species and observations of any important plant communities, bird assemblages or other potentially valuable ecological features were recorded. Details of the preliminary survey methods for each legally protected species are given below and any specific limitations to the survey(s), such as access constraints, are set out in section 2.13.

2.3 Badgers

Badgers tend to live in family groups with clearly defined territories with the main sett, used throughout the year, as a focal point. The territory often also contains a number of 'annex', 'subsidiary' and outlier setts that are used intermittently. Badgers can exist in a variety of habitats, but a mixed farmland landscape containing pasture and arable land, studded with woodland, scrub and hedgerows support the highest population density.

A comprehensive walkover survey of the site was undertaken in April 2022, covering all field parcels, woodlands and boundary features. Special attention was paid to boundary features such as hedgerows, woodland edge, earth banks, and fence-lines, where signs of badger activity are often concentrated. Surveyors searched for badger setts, latrines, foraging marks, footprints and worn pathways, and trapped hairs on fences and any other evidence of badger activity.

Any setts identified were subject to on-going monitoring during other survey visits to determine the type of sett and current occupation by badgers. Where necessary, motion sensitive cameras 'trail cams, or other non-intrusive methods (e.g. laying soft damp sand, placing dead leaves or straw or sticky hair traps at entrances) were used to confirm occupation by badgers. This survey methodology is in accordance with Harris, et al (1989)⁵.

2.4 Bats

There are 18 species of bat resident in the UK, each with their own specific habitat requirements. Bats can use a wide range of features for roosting purposes including loft spaces, cavity walls, loose tiles, mortice joints and cracks/gaps in a variety of built structures. They can also be found in trees with holes, splits, cracks, cavities, ivy and loose bark. Bats are generally active at night and utilise a wide range of habitats for foraging and commuting between roost sites, hibernation sites and foraging habitats. Linear

⁵ Harris, S, Cresswell, P. and Jefferies, D. (1989) *Surveying Badgers*. Mammal Society.



features such as hedgerows, woodland edges, even fences can be important for navigation between roosting and foraging habitats.

2.4.1 Natural Roost Features – Trees

All trees likely to be affected directly by the proposed development (see Appendix 1) were subject to a ground-based visual inspection to identify potential roost features, followed by climbing inspections where necessary and safe, to look for evidence of roosting bats and to further assess the suitability of the feature. This included an additional climbed survey of any roost features suitable for hibernating bats in February 2023. Each tree/feature was categorised for its potential to support roosting bats as shown in Table 1 in accordance with best practice guidance⁶.

Table 1. Characterising potential roost features in trees.

Category	Description
Negligible	A tree with negligible roosting habitat features likely to be used by bats.
Low	A tree of sufficient size to potentially support roosting features, but with none seen from the ground or features identified of limited roosting potential.
Medium	A tree with one or more potential roost sites that could be used by bats due to their size, conditions and surrounding habitat, but unlikely to support a roost of high conservation status such as a maternity or hibernation roost.
High	Trees with one or more potential roost sites that appear suitable for large numbers of bats or use as maternity or hibernation roosts.

2.4.2 Built Structures

A detailed ground based visual assessment was carried out of the buildings at the centre of the site (see Appendix 1 for locations), including Building 1 'The Barn' and Building 2 'Old Place', looking for features with potential to support roosting bats (e.g. gaps under tiles, soffits, cracks or gaps in brickwork and cladding) and any evidence indicating the presence of bats, such as rub marks, staining or droppings beneath potential roost features. Where possible and safely accessible, internal inspections of potentially suitable enclosed loft spaces were made to search for evidence of use by bats (live bats, dead bats, droppings, rub marks or staining of timbers). An additional survey of the cellar associated with Building 2 was carried out in February 2023 to check for any signs of hibernating bats.

2.4.3 Emergence/Re-entry Surveys

In accordance with survey findings and best practice guidance, three emergence/re-entry surveys were undertaken between August and September 2022, covering all buildings assessed as having high potential to support roosting bats. The surveys were carried out using methodology provided by the Bat Conservation Trust⁶.

The surveys focused on all features identified during the initial assessment as potential roosting sites or access points for bats, with surveyors positioned according to Figure 3 in Appendix 1. From these locations, surveyors could see all features potentially suitable for roosting bats that were identified during the initial bat scoping survey. Surveyors were positioned to start surveillance at approximately 30 minutes before sunset and continued until at least one and a half hours after sunset and up to 2 hours depending on the level of activity.

⁶Collins, J.(ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London.



The surveyors recorded any bat activity on or around the potential roosting entry/exit features. All surveys were undertaken during weather conditions suitable for bat activity and at ambient temperatures above 10°C. The surveyors recorded bat activity using 'Echo Meter Touch' bat detectors featuring auto-identification of bat species and automatically triggered recording for later review.

2.4.4 Bat Activity Surveys – Walked Transects

Bat activity surveys followed best practice guidelines⁶. Pre-determined transect routes were followed by surveyors (see Appendix 1, Figure 4), focussing on all linear features within the site boundary (tree-lines, woodland edge and hedgerows). The northern route included the north-east corner for the months April–June but due to practicalities of the route and as this part of the site will not be impacted by the development, it was not included within the last surveys (July–September). The transect routes were walked at a slow pace during the period from sunset to two hours after sunset by a team of surveyors, such that each part of the route was passed approximately every twenty minutes. All surveys were undertaken during weather conditions suitable for bat activity and at ambient temperatures above 10°C. The surveyors recorded bat activity using 'Echo Meter Touch' bat detectors featuring auto-identification of bat species and automatically triggered recording for later review. The locations of all bat 'registrations' was recorded onto a field map during the survey to correspond with all sound recordings.

2.4.5 Bat Activity Surveys – Automated Static Bat Detecting

Six Song Meter Mini static bat detectors were deployed across the site (see Appendix 1, Figure 4) on six separate occasions, once a month between April and September 2022, and left in the field for a minimum of five days – the expected maximum lifetime of the battery. Static bat detectors comprise a passive recording device with real-time full-spectrum calls that can be viewed in detail once downloaded on analysis software, allowing accurate identification of most bat calls to species level (or genus level in the case of *Myotis* and *Plecotus* spp.).

The walked transect and static bat detector ('bat logger') survey methods complement each other with the transect surveys providing information on foraging and commuting patterns, and distribution across the site; and automated static detector surveys giving more prolonged coverage through consecutive nights, thus increasing the likelihood of detecting scarce species.

2.4.6 Bat Activity Surveys – Trapping and Radiotracking

Temple Group Ltd carried out trapping and radiotracking at Ansty in 2022. They have produced a separate report⁷, to be issued alongside this one.

2.5 Breeding Birds

The methods used for the breeding bird survey were adapted from a methodology developed by the Bird Survey and Assessment Steering Group (RSK Biocensus)⁸. This methodology requires six visits spread evenly between late-March and early-July. Any deviation from this number should be justified. These should be carried out approximately 30 minutes before sunrise through to mid-morning (10am

⁷ Temple (2023) Bat Trapping and Radiotracking Report, Greater Ansty New Village

⁸ <https://birdsurguidelines.org/methods/survey-method/>



to 11am). At least one of these visits should be in the evening, extending past sunset. All bird surveys were only undertaken during favourable weather conditions for bird activity, with periods of persistent or heavy rain, high winds or fog avoided.

A pre-determined transect (see Appendix 1, Figure 4) was walked on each visit, during which the observer recorded all birds encountered. As recommended in the guidelines, the transect route was walked at a constant slow pace by a competent bird surveyor, stopping to check any priority habitat/features and causing minimum disturbance, recording all birds detected either by sight or calls/song. Notes regarding the behaviour of birds identified were made to determine their breeding status. Birds were said to be 'confirmed as breeding' if they were observed carrying nesting material, food or faecal pellets; or nests, eggs, or recently fledged young were discovered. Birds were recorded as 'likely breeding' if observed singing or displaying, repeatedly visiting the same locations, and showing agitated or distraction behaviour. Each bird 'registration' was recorded on a field map of the survey site using standard BTO Common Birds Census (CBC) notation⁹, which includes behaviours and flight movements – new standards. A note was also made of the start and end time, sunrise/sunset time, temperature, wind (Beaufort scale) and precipitation levels.

2.6 Common Dormouse

Common dormice are typically associated with broadleaved woodland habitat, hedgerows and scrub. They tend to occur at low density and good habitat connectivity is important. Common dormice need a constant supply of food throughout the active season over a large home range. A diversity of tree and shrub species will provide a range of fruit, nuts and insects. They hibernate during the winter – typically at ground level amongst leaf litter and mosses protected by coppice stools, tree stumps or piles of brash wood.

2.6.1 Nest Tube/Box Survey

Dormouse surveys are undertaken by attaching purpose built 'nest tubes' on trees and shrubs in suitable habitat such as woodland, scrub and hedgerows. Nest tubes are used by dormice as places of shelter and they will often construct their nests within them during their periods of activity (typically between April and November). In accordance with current best practice guidelines¹⁰, 400 nest tubes were deployed approximately 20m apart in suitable habitat across the site, including woodland, hedgerows and scrub, in April 2022 and left *in situ* for the survey season (see Appendix 1, Figure 6). These were checked on a monthly basis for presence of animals and evidence of dormouse presence (distinctively woven nests) from May to September 2022. Since the likelihood of use by dormice varies through the year, an index of probability score is used to determine confidence in a particular survey (see Table 2 below) comprising checks over several months. A minimum score of 20 is normally accepted to establish 'likely absence' in the event that no signs of dormice are found during the survey.

Dormice checks were undertaken in the mornings and commenced one month after the nest-tubes were positioned. Surveys were undertaken under the supervision of licensed surveyor, Kate Lewis, dormouse survey Class 1 licence holder.

⁹ https://www.bto.org/sites/default/files/u16/downloads/forms_instructions/bto_bird_species_codes.pdf

¹⁰ Bright, B., Morris, P., Mitchell-Jones, A.J. and Mitchell-Jones, T (1997) *The Dormouse Conservation Handbook*. English Nature.



Table 2. Search effort score for each month that dormouse tubes are out on the site and subject to surveys

Month of check	Index of probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

2.7 Great Crested Newts and Other Amphibians

Great crested newts require ponds for breeding that meet a series of habitat criteria including good quality water, aquatic plants and an absence of predatory fish. The ponds must have good connectivity to semi-natural terrestrial habitats that provide their invertebrate food sources and suitable safe places to rest and hibernate outside the breeding season. Great crested newts tend to occur more frequently in areas of high pond density across the landscape in 'metapopulations' where habitat occupancy ebbs and flows according to changes in conditions.

Common toad *Bufo bufo* are a priority species in England under Biodiversity 2020: A strategy for England's wildlife and ecosystem services and under section 41 of The Natural Environment and Rural Communities (NERC) Act 2006, where UKBAP species were recognised as of principal importance for the conservation of biodiversity. This species should therefore be considered during planning and development. No surveys have been undertaken at the site that specifically target common toad but a record has been made if they are found during any other site visit/survey.

2.7.1 Habitat Suitability Assessment

Ansty contains 11 ponds within its boundaries. The desk study revealed a further 21 ponds within a 500m radius of the site boundaries (excluding ponds which are separated from the site by a significant barrier to amphibian movement such as a major road). See Appendix 1, Figure 7 for the location of the ponds.

Where ponds were visible from public rights of way or where access permission was granted, they were assessed for their potential to support great crested newts using the Habitat Suitability Index (HSI) (Oldham et al 2000).

Those ponds within 250m of the site's boundaries and with 'average' or 'above average' suitability for breeding great crested newts, were carried forward for Environmental DNA (eDNA) sampling and/or presence/likely absence surveys.

2.7.2 Environmental DNA Sampling and Analysis

This relatively new technique allows a quick and reliable qualitative measure of the presence/likely absence of great crested newts. It involves collection of water samples from a pond, using a standard protocol set out by Natural England¹¹. The samples are sent to an approved laboratory to isolate and

¹¹ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn



determine presence of environmental DNA (eDNA) shed into the water by amphibians during the breeding season. Samples for eDNA analyses were taken from ponds 1, 3, 4, 13, 20 and 32 on 20th April 2022. All six ponds returned a negative result for great crested newt DNA and no further surveys were carried out.

2.7.3 Field Survey

Ponds 6, 7, 8 & 9 were carried forward for further surveys. The survey methodology followed standard guidance for great crested newts¹². Six survey visits were undertaken using a combination of bottle-trapping, torchlight searching and egg searching during each survey visit; ponds 8 & 9 had dried up after two survey visits and surveys were discontinued. All surveys were undertaken during weather conditions suitable for great crested newts – above the minimum temperature of 5°C – and at least three of the survey visits were undertaken during the ‘peak activity period’ for breeding great crested newts (i.e. between 15 April and 15 May). Weather conditions, temperature and pond turbidity was recorded during each survey visit.

2.8 Reptiles

The common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis* grass snake *Natrix natrix* and adder *Vipera berus* are widespread species that can be found in many semi-natural habitats, such as rough grassland, scrub, heathland and open woodland where there is good vegetation cover, an abundance of invertebrate, amphibian or small mammal prey and areas of open ground for basking.

Standard reptile presence/likely absence surveys involve setting out artificial refugia (reptile ‘mats’ or ‘tins’) in potentially suitable habitat. Reptile mats are pieces of roofing bitumen felt, corrugated onduline or carpet tiles, and reptile tins are pieces of corrugated metal sheet, all of which are approximately 1m x 0.5m in size. These refugia absorb heat from the sun more rapidly than the surrounding vegetation and provide cover and basking places attractive to reptiles. They are placed in areas of potentially suitable habitat at an approximate density of 20 per ha, or 20m apart along linear features, and are then checked for presence of animals under suitable weather conditions. There are no up-to-date best practice guidelines for reptile surveys, but a minimum of seven survey visits under suitable weather conditions is generally considered to be adequate when determining their presence/likely absence, and 15–20 visits are used to calculate a ‘peak count’ for population size class assessment.

A total of 400 roofing felt mats were used in this survey (see Appendix 1, Figure 8). The mats were left *in situ* for a minimum of one week to ‘bed in’ and allow reptiles to locate them before the first check. The mats were checked at least seven times over the period May to September 2022 and all observations of reptiles were recorded, together with the weather conditions, temperature and time of day. The location of the mats may have changed slightly from initial setup due to surveyors moving the mat to a better location (e.g. more sun) or the mats may have been replaced following damage.

F 2014. *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

¹² English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.



2.9 Riparian Wildlife

Watercourses and waterbodies can support a range of protected species, principally otter, water vole *Arvicola amphibius* and white-clawed crayfish *Austropotamobius pallipes*, and can create rare woodland ghyll habitat under the right conditions.

Copyhold Stream runs through the northern half of the site and along the eastern boundary. A small tributary from the stream runs through the southern half of the site. Two walked surveys along the stream were carried out on 22nd April and 30th June 2022, looking for signs of crayfish, otter and water vole, including feeding remains, latrines and scat.

2.10 Other Notable Species

The site's habitats were broadly assessed for their potential to support species of principal importance for nature conservation (Section 41 NERC Act 2006) and other notable species. This includes mammals such as harvest mouse *Micromys minutus*, hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, and many bird species. The site was broadly assessed for its potential to support important invertebrate assemblages, with specific attention paid to features such as standing dead-wood, wet flushes, bare earth banks and botanically rich areas.

2.11 Invasive Non-native Species

No specific surveys for invasive non-native species (INNS) were undertaken. However, the presence of any invasive non-native species encountered during other fieldwork, was recorded.

2.12 Impact Assessment Methodology and Mitigation

The assessment of ecological impacts and mitigation recommendations in this report follow CIEEM Guidelines for Ecological Impact Assessment (EclA)². This involves evaluating the importance of an 'ecological feature' (habitat, vegetation community, population of a single species or assemblages of species) in terms of nature conservation priority, followed by the application of the 'mitigation hierarchy'.

2.12.1 Importance of Ecological Features

A level of importance was assigned to all existing ecological features through consideration of the rarity and distribution of a habitat or species, the population size, ecological function, and trends (declining/expanding), together with any designations, legal status, or conservation policies. CIEEM recommend that the importance of an ecological feature, in terms of nature conservation priority, should be considered within a defined geographical context (for definitions used by The Ecology Co-op, see Appendix 1):

- international and European
- national
- regional
- county
- local or parish



- site/negligible.

Where protected species are present and there is the potential for a breach of the legislation as a result of the development proposals, those species are considered as 'important' features and included in the EcIA. However, the level of importance assigned to the affected population of a protected species will vary depending on contextual information about the population size, distribution, abundance and trends across the range of geographical scales.

Similarly, irreplaceable habitats such as ancient broadleaved woodland are considered as important features and included in the EcIA. The level of importance will vary depending on the size of the habitat parcel, its distribution and abundance at different geographical scales.

Features that are considered to be important at site level only, or are of negligible importance (such as paved ground or amenity grassland) are excluded from this EcIA and it should be reasonable to assume that if a feature is not mentioned, it is not ecologically important.

2.12.2 Significance of Effects

In accordance with EcIA (CIEEM 2018)², a significant effect is defined as “an effect that either supports or undermines biodiversity conservation objectives for important ecological features”. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy). The effects may be described as significant at a range of geographic scales as defined above.

The impacts are identified and described in relation to the following characteristics:

- *adverse or positive* – does the impact result in the loss or gain in biodiversity/quality of the environment?
- *extent, magnitude* – the spatial area over which the impact may occur, the area of habitat lost, or the number of individuals/populations affected
- *timing* – in relation to the life cycle of the ecological feature (e.g. nesting bird season)
- *duration, frequency* – is the impact temporary or permanent, frequently repeated or a one-off event?
- *reversibility* – is the impact temporary or permanent? Would the ecological feature recover after the impact?
- *cumulative impacts* – in combination with other plans/projects.

This report has only sought to describe in detail the impacts that are likely to be significant. Impacts that are either unlikely to occur, or if they did occur are unlikely to have a significant effect have been discounted or 'scoped out' at an earlier stage. Effects on the conservation status of ecological features are only assessed in detail if they have a high enough value (local or above) and impacts upon them may be a material consideration in decision-making in terms of legislation and planning policy. Impacts on features below local value are categorised as of neutral significance and are not considered further. However, where it has not been possible to robustly conclude that there are no significant effects (due to insufficient survey data or scientific research for example), then the precautionary principle will be applied and a significant effect is assumed.



2.12.3 The 'Mitigation Hierarchy'

The assessment of the significance of an effect is made initially in the absence of mitigation. This is followed by a sequential process of determining the most appropriate way to remove or minimise significant effects. The preferred option is to avoid impacts in the first place, for example by redesigning the scheme to retain an important area of habitat, or timing works sensitively. Mitigation measures such as translocation or displacement of populations is only applied as a last resort where significant effects are unavoidable.

When residual significant adverse effects remain after all practicable measures to avoid and/or minimise impacts have been applied, compensation measures are required. Compensation measures include habitat creation in alternative locations that offset unavoidable habitat loss.

Finally, enhancements are proposed that do not relate to a specific impact and effect but provide net gains in biodiversity – taking advantage of opportunities in the design and operation of the proposed development. These measures are intended to ensure that the proposed development contributes towards national and local biodiversity objectives.

2.13 Constraints/Limitations to Surveys

Surveys record any flora or fauna that is present at the time of the survey visits. It is therefore possible that some species may not have been present during the surveys but may be evident at other times of the year and may appear or disappear from the site if habitat conditions change. For this reason, the surveys are considered valid for up to eighteen months for badgers and bats, two years for reptiles and three years for great crested newts and dormice. If the habitat conditions change significantly in the intervening period, then it is recommended that the surveys be updated.

3 ECOLOGICAL BASELINE

3.1 Designated Sites

The site lies on the border of the High Weald Area of Outstanding Natural Beauty and is 1.3 km west of Blunts and Paiges Wood Local Nature Reserve (LNR) and 1.6 km west of Ashenground and Bolnore Woods LNR. There are no European sites (such as Special Protection Areas) situated within 10 km of the site. Within 2km of the site there are five Local Wildlife Sites and three designated verges within, including Great Wood & Copyhold Hanger Local Wildlife Site (LWS) which lies immediately adjacent to the south-east boundary. No other statutory designated sites for nature conservation are found within 2km. See Appendix 2 (Table 1 and Figure 1) for details

The site contains approximately 8.87 ha of Ancient Woodland and 17.42 ha of Priority Lowland Mixed Deciduous Woodland and is well connected to similar habitat within the surrounding area (see Appendix 2, Figure 2).

There is one granted EPS licence for mitigation projects within 1 km of the site boundary, concerning the destruction of a resting place for brown long-eared bats *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* 800 m south-west of the site



boundary (see Appendix 2, Figure 3).

3.2 Habitats

The site comprises mostly of arable fields, with multiple parcels of woodland and tall grassland. The fields are separated by hedgerows which, for the most part, are native species-rich and provide high value green corridor habitat throughout the site. An overview of the individual habitats is provided in Table 3 below, with more detailed descriptions provided within sections 3.3 and 3.8. See Figure 3 for a habitat map of the site and Appendix 3 for corresponding photographs. Common names are used for botanical species within this report, with the scientific name provided in Appendix 2.

Table 3. The habitats contained within the site.

Habitat type	UKHab Code	Area/length	Species composition	Ecological importance
Area (polygon)				
Arable and horticulture	c1	48.04 ha	The majority of the site comprises arable fields, sown with rye grass, barley and broad bean.	Site
Arable field margins	c1a	4.63 ha	See section 3.3	Local
Other neutral grassland	g3c	7.87 ha	See section 3.3	Site
<i>Arrhenatherum</i> neutral grassland	g3c5	4.81 ha	A few of the fields are dominated by false oat-grass and are likely harvested for hay/silage.	Site
Modified grassland	g4	8.69 ha	See section 3.3	Site
Lowland mixed deciduous woodland	w1f	17.42 ha	See section 3.3	District
Other woodland – broadleaved	w1g	4.84 ha	See section 3.3	Local
Other coniferous woodland	w2c	0.75 ha	See section 3.3	Local
Rivers and lakes – pond	r	0.13 ha	See section 3.8	Local
Built up areas and gardens	u1	1.3 ha	There are two houses, with associated residential gardens, at the centre of the site. The gardens comprise close mown lawns, manicured hedgerows and a mix of native and ornamental trees and shrubs. The buildings are described in section 3.5 and the garden ponds are described in section 3.8.	N/A
Linear (line)				
Hedgerow (non-priority)	h2	1.03 km	A species poor, damaged hedgerow forms the south-eastern boundary of the site. The hedgerow is dominated by bramble and bracken with occasional trees, including elder and sycamore.	Local
Hedgerow	h2a	5.83 km	The majority of the hedgerows on site are native	Local



Habitat type	UKHab Code	Area/ length	Species composition	Ecological importance
(priority)			species-rich hedgerow with trees, and are largely minimally managed, providing high value habitat for wildlife. Species recorded include field maple, oak, blackthorn, sycamore, hawthorn, hazel, dogwood, elder, holly, ash, bramble, rose, bracken, honeysuckle. The hedgerow at the centre of the site also contains wild service tree and spindle. The hedgerow along the western boundary of the site has frequent mature trees, with similar composition but with the addition of horse chestnut, beech and common lime.	
Ecologically valuable line of trees	w1 (34)	0.09 km	There is a line of oak trees bordering a horse paddock within the south-east section of the site.	Local
Canal or ditch - Stream	r1e	2.7 km	The Copyhold Stream includes a confluence point with the largest of the two tributaries flowing onto the site from the west across the A272 and a second small stream flowing southwards past the wastewater treatment works, which augment the flow. The watercourse runs southwards past the eastern boundary of the site after this confluence point and has steep clay banks with a stony bottom comprising a mixture of shallow faster flowing sections and deeper pools.	District
Built linear feature – sealed surface	u1e	1.15 km	A hardcore track bisects the site, providing access to a residential property along the eastern boundary.	N/A

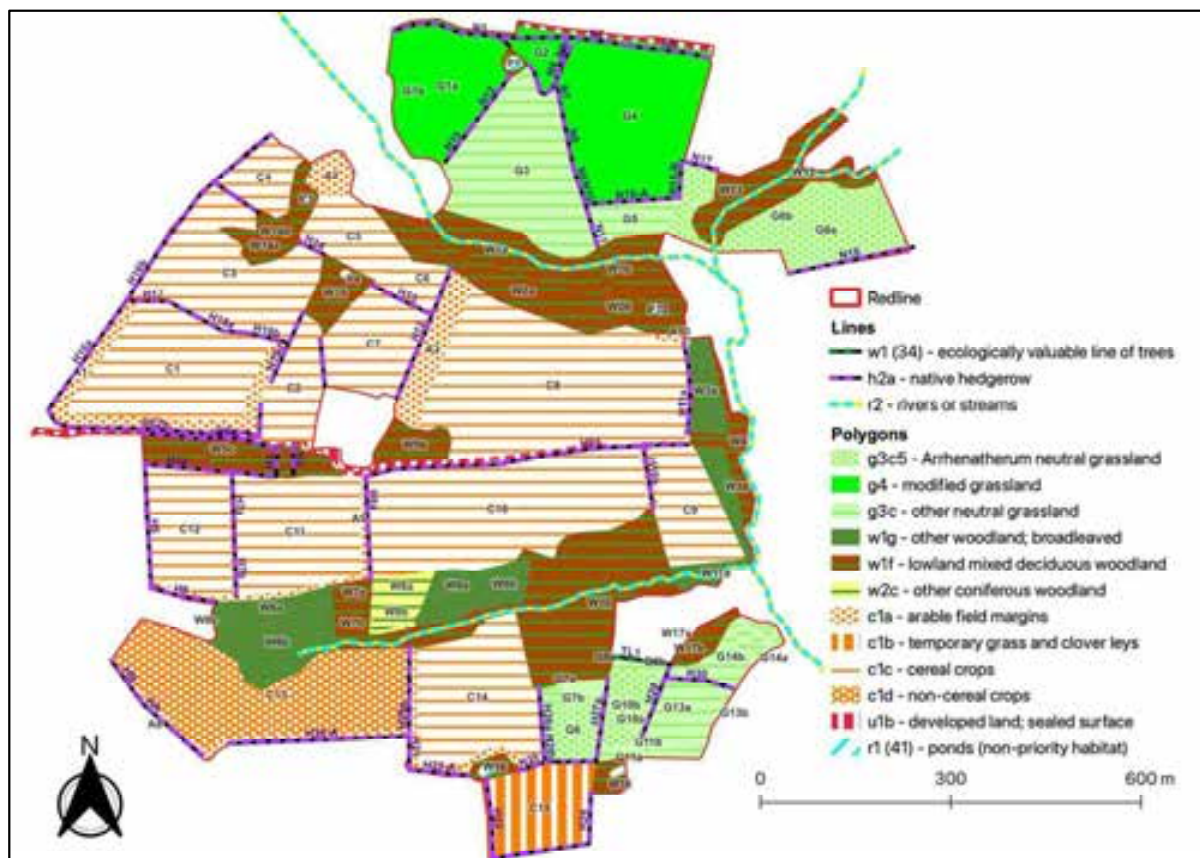


Figure 3. A UKHab map of existing habitats at the proposed development site. All habitats parcels have been labelled with a reference code. Image produced using QGIS software, version 3.16.3 – Hannover.

3.3 Botanical Baseline

As an extension to the UKHab survey the detailed botanical survey provides a full species list for the habitats present on the site.

In brief, the grassland (neutral and modified) appears to be subject to little management and is allowed to grow tall and coarse. The arable margins are mostly not of any notable botanical interest, with the exception of two relatively large areas at the centre of the site. The woodland parcels vary in composition and condition, but some are relatively diverse with an interesting ground flora, including multiple ancient woodland indicators.

Arable field margins

The majority of the fields on site have a margin of mostly rank vegetation, with frequent false oat-grass, cocksfoot, rough meadowgrass, creeping bent, creeping thistle and bristly oxtongue. Occasional or rare amounts of the following species were also recorded: redshank, scarlet pimpernel, hoary plantain, greater plantain, goosefoot sp., creeping buttercup, marsh cudweed, common fleabane, curled dock, tall fescue, dandelion, ragwort, hoary willowherb, sharp-leaved fluellen, round-leaved fluellen, common mouse-ear, scentless mayweed, red clover, oxeye daisy, creeping cinquefoil, field bindweed, self-heal, crested dog's-tail, bird's-foot trefoil, white clover, cut-cleaved cranesbill, thyme-leaved speedwell, germander speedwell, hard rush and smaller cat's-tail. Trailing St John's wort was recorded within the southern margin of the field south-east of the central track and hairy buttercup was recorded at the



centre of the site.

There are two notable field margins at the site; one is an area measuring approximately 0.4 ha, north-west of the central fields, the second is a 40 m wide margin at the centre of the site. Both have been seeded with a wildflower rich mix, including frequent knapweed, oxeye daisy, creeping thistle and yarrow, occasional white clover, creeping buttercup, bird's-foot trefoil, red fescue, smooth meadowgrass, rough meadowgrass, Yorkshire fog, crested dog's-tail, selfheal and rare amounts of thyme-leaved speedwell, yellow rattle, curled dock, cocksfoot, spear thistle, dandelion, field forget-me-not, ribwort plantain, hoary willowherb, red clover, smaller cat's-tail, smooth tare, hoary plantain, ragwort, lady's bedstraw, greater knapweed, hedge bedstraw, spear thistle and grass vetchling.

Other neutral grassland

Northern field: tall vegetation comprising abundant Yorkshire fog, frequent sweet vernal, creeping thistle, common sorrel, white clover, meadow buttercup, occasional ragwort, lesser stitchwort, red clover, cocksfoot, common bent and rare amounts of meadow vetchling, bird's-foot trefoil, meadow foxtail, rough meadowgrass, hard rush, curled dock, false oatgrass and smooth meadowgrass.

South-east corner of the site: these fields appear to be minimally managed, comprising frequent cocksfoot, red fescue, Yorkshire fog and hairy sedge, occasional rough meadowgrass, sweet vernal grass, meadow foxtail, common bent, creeping cinquefoil, germander speedwell, ragwort, lesser stitchwort, meadow buttercup, creeping buttercup, marsh thistle, yarrow, cleavers, rare amounts of common spotted orchid, curled dock, meadow vetchling, smaller cat's-tail, meadow buttercup, oak and ash saplings and encroaching bramble and bracken.

Modified grassland

The northern fields of modified grassland comprise abundant white clover, frequent meadow buttercup and creeping thistle, occasional Yorkshire fog, creeping buttercup, bird's-foot trefoil, curled dock, sweet vernal, crested dog's-tail and rare amounts of red clover, lesser stitchwort, perennial ryegrass, meadow foxtail and smooth meadowgrass.

Arrhenatherum neutral grassland

Several fields are dominated by false oatgrass with rare amounts of other forb species, recorded within the adjacent neutral grassland, such as creeping buttercup and selfheal.

Woodland

There are multiple parcels of woodland across the site, including ancient semi-natural, priority habitat deciduous woodland and a mix of broadleaved and conifer plantation woodland. A general description of each woodland parcel is provided in Table 4 with detailed species composition in Appendix 2 (Table 3). Woodland parcels W1, W2, W4 and W10 were identified as candidate ghyll woodlands owing to their topography. This is a habitat restricted to the weald area of Sussex and Kent and is typified by woodland habitat found in the extreme upper reaches of rivers where springs and streams form steep wooded valleys supporting a climate that usually supports a diverse and interesting range of bryophytes. An assessment of the bryophyte communities across these woodland parcels has identified 29 species of mosses and liverworts, with 27 of these species being common and widespread, whilst dentated silk-moss *Plagiothecium denticulatum* is recognised as widespread but infrequent and shining hookeria *Hookeria lucens* understood to have a predominantly northern and western



distribution.

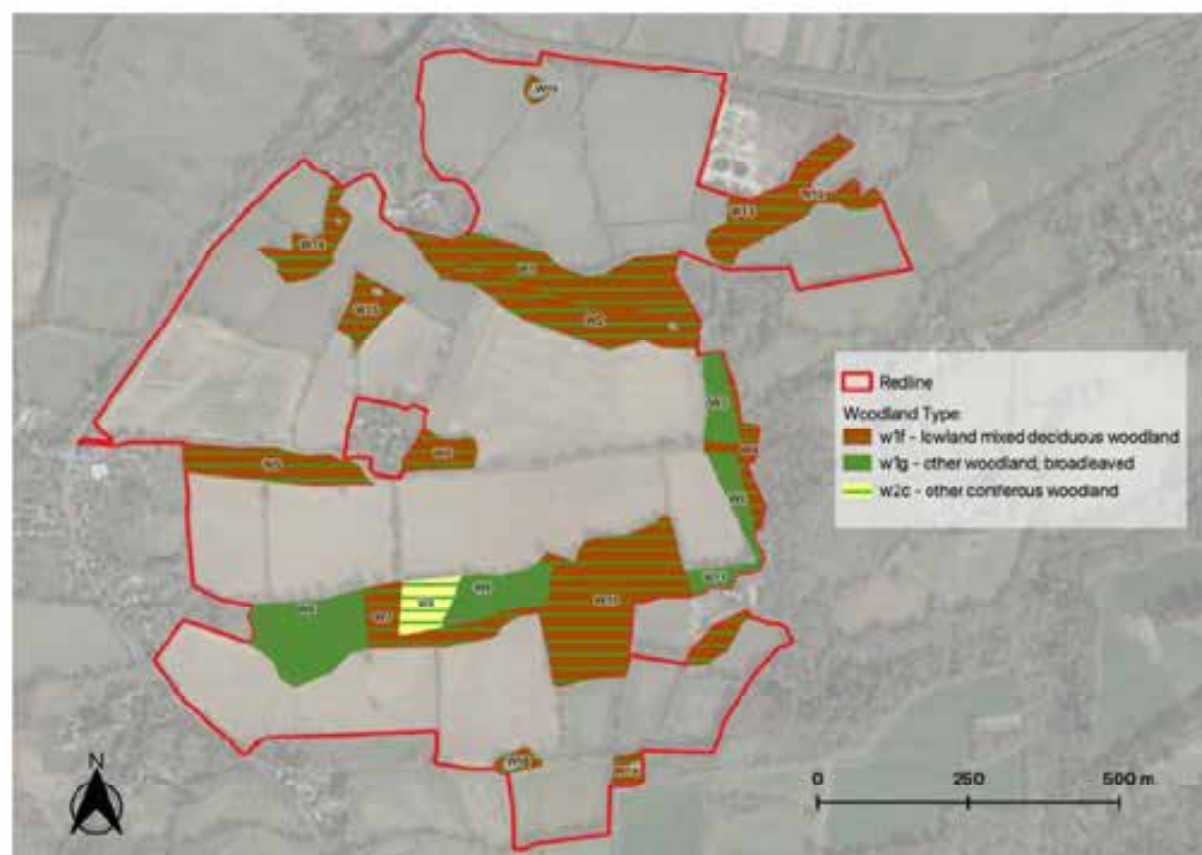


Figure 4. A map of woodland parcels at Ansty, numbered and colour coded to aid interpretation of Table 4 and Appendix 2.

Table 4. A general description of the woodland parcels at Ansty

Woodland type	Description (number relates to woodland parcel numbering shown on Figure 4)
Broadleaved woodland	1 & 4: Dense broadleaved woodland with diverse species of tree and flora 7: Low botanical diversity to the west, with signs of disturbance, frequent willow and occasional poplar. More diverse along the stream but becomes dominated by bramble to the east. 12: Broadleaved woodland with ancient woodland indicators. 13: An old Victorian landfill with rubble and glass throughout. 14: A small parcel of woodland with a steep bank and a small stream and woodland pond 15: A small parcel of woodland with dense ground flora in places, including three nerved sandwort and early purple orchid. There is a pond which is surrounded by dense scrub. 16: A small parcel of scrubby woodland surrounding a pond 17: A small parcel of scrubby woodland adjacent to a horse paddock. 18: A small parcel of woodland with a footpath through it and a large pond to the east. Ground flora around the footpath is dominated by bramble. Frequent wood anemone carpets the woodland around the pond. 19: Dense scrubby woodland surrounding a pond
Ash plantation	2: Less diverse than the adjacent broadleaved woodland and dominated by ash 5: Approx. 30yrs of age ash plantation, with ash dieback frequent. A small area in the central parcel is dominated by oak.



Woodland type	Description (number relates to woodland parcel numbering shown on Figure 4)
	9: Old ash plantation with some interesting ground flora. Bramble frequent. Alder along the stream.
Chestnut coppice	3: Sweet chestnut plantation with dense leaf litter and scattered ground flora
Hybrid poplar plantation	6: Hybrid poplar plantation with alder understory and dense leaf litter.
Larch plantation	8: Larch plantation
Hazel coppice	10: Recent coppicing management evident. Open areas and dense bluebells.
Laurel and rhododendron	11: Woodland is dominated by Invasive Non-native Species (INNS)

3.4 Badgers

3.4.1 Survey Results

Due to the sensitive nature of information pertaining to badgers, this section should be omitted from the report prior to release into the public domain.

[REDACTED]

[REDACTED]

Please note that the exact location of badger setts is confidential and will be submitted to the LPA directly, upon request.

3.4.2 Pre-existing Records

[REDACTED]

3.4.3 Interpretation

[REDACTED]

[REDACTED]



3.5 Bats

3.5.1 Natural Roost Features – Trees

A ground level tree assessment identified 13 high suitability trees, 17 with moderate suitability and 62 low suitability trees for roosting bats (see Appendix 2, Figure 4 and Table 4). All moderate and high potential trees were climbed twice and three times respectively in 2022, to confirm roost features and to search for roosting bats. No bats were found but the roost features have potential to become occupied at any time. A further hibernation survey of all 'high' and 'moderate' trees was carried out in February 2023 with no evidence of roosting bats identified.

Trees that could not be safely climbed were subject to emergence surveys in 2023 utilising surveyors and supporting night-vision cameras.

3.5.2 Built Structures – Roost Appraisal

There are two main residences at the centre of the site which are surrounded by a number of smaller outbuildings. All 10 buildings were assessed for their potential to support roosting bats, the details of which are provided in Appendix 2, Table 5.

Three of the buildings were confirmed to be in use by bats or were assessed as having high potential to support roosting bats (buildings 1, 2 and 3), five of the buildings have moderate potential and the remaining two buildings have low potential. Further survey work was recommended for buildings 1, 2 and 3, comprising three emergence surveys, and these were carried out between 26th July and 3rd September 2022.

Additionally, a further hibernation survey of the cellar associated with Building 2 was carried out in February 2023, with no evidence of bats identified.

3.5.3 Built Structures – Emergence Survey

The dates, times, weather conditions, temperatures and personnel for each survey visit are presented in Appendix 2, Table 6.

Detailed descriptions of the emergence surveys are provided in Appendix 2. In summary, Building 1 was confirmed to support a day roost for common and soprano pipistrelle bats, and Building 2 was confirmed to support day roosts for common and soprano pipistrelle, brown long-eared bat(s) and an unknown myotis species.

Building 3 was shown to support brown long-eared bats, which are likely using the building as a maternity roost, with a peak of seven bats recorded emerging on 26th July 2022.

3.5.4 Bat Activity Surveys – Walked Transects

Survey conditions and timings are presented in Appendix 2, Table 7. The route of each walked transect



was covered at least two times in a session, with all bat passes recorded and directional data for all bats noted where bats were visible. The results of each walked transect survey are summarised in Appendix 2, Figure 5.

The walked transect surveys recorded six known species and one unknown myotis species. These were: common pipistrelle, soprano pipistrelle, brown long-eared, noctule, serotine and barbastelle. Generally, high activity was recorded for common and soprano pipistrelle, particularly around the sewage works in the north-east corner of the site, and along hedgerows and woodland boundaries. Low activity was generally recorded for the other species, with the exception of a few isolated instances of high activity from serotine and a myotis species.

As is to be expected, the woodland and hedgerow features are of high value to bats, which use them to commute and forage along.

3.5.5 Bat Activity Surveys – Automated Static Bat Detecting

The results of the automated static bat detector surveys are summarised in Appendix 2, Table 8.

The records reflect that of the walked transect survey, with common and soprano pipistrelle recorded in high numbers, relative to the other species. An additional species, Nathusius' pipistrelle, was recorded by the static loggers, though this only comprised a few passes.

Logger 4, along the central tree line, recorded an exceptionally high number of passes by common pipistrelle, with a peak average of 719 passes on a single night in June. Logger 6, within the south-east of the site, recorded an exceptionally high pass rate for myotis in September, relative to recordings for this species across the rest of the site over the survey season.

There was one instance of a logger failing to record any data: Logger 2 in May.

3.5.6 Pre-existing Records

The SxBRC provided 100 bat records in the search area comprising 10 identified species. The number of records for each species is presented in Table 5.

Table 5. Number of pre-existing records of each bat species within 2 km of the site boundary.

Species	No. of records
Common pipistrelle <i>Pipistrellus pipistrellus</i>	27
Brown long-eared <i>Plecotus auritus</i>	27
Unidentified bat species	12
Soprano pipistrelle <i>Pipistrelle pygmaeus</i>	7
Long-eared <i>Plecotus</i> species	5
Pipistrelle <i>Pipistrellus</i> species	5
Serotine <i>Eptesicus serotinus</i>	5
Myotis species	3
Noctule <i>Nyctalus noctule</i>	2
Daubenton's <i>Myotis daubentonii</i>	2
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	1
Whiskered/Brandt's <i>Myotis mystacinus/brandtii</i>	1



Natterer's <i>Myotis nattereri</i>	1
Whiskered <i>Myotis mystacinus</i>	1
Bechstein's <i>Myotis bechsteinii</i>	1

3.5.7 Interpretation

Three of the buildings at the centre of the site are confirmed to be in use by bats, with the surrounding buildings also having moderate/low potential – these have not been surveyed to date.

The activity surveys have demonstrated that the habitats contained within the development site support seven identified species and unknown myotis species(s). This includes barbastelle and serotine, which are classed as vulnerable to extinction, and Nathusius' pipistrelle which is near threatened. Although it is not possible to identify the myotis species from their calls, the SxBRC data shows that Daubenton's, whiskered/Brandt's, Natterer's and Bechstein's bats have all been recorded locally.

The trapping and radiotracking surveys, undertaken by Temple recorded the following:

'...A total of 67 bats from ten species were captured. The species included barbastelle, Bechstein's, Alcaethoe, Brandt's, brown long-eared, common pipistrelle, Daubenton's, Natterer's, soprano pipistrelle, and whiskered bat.... Breeding females from four species Alcaethoe, brown long-eared, common pipistrelle and whiskered were trapped... During the surveys, six roosting locations were identified, all between 300m east and 1.2km north-east... radio-tracking surveys have confirmed the importance of the site at a regional level for the rare Bechstein's bats, barbastelle and Alcaethoe bats...

Taking into consideration all of the survey data, the development site is considered to be important to bats at the regional level.

Table 6. Conservation status and distribution of bats recorded on site.¹³

Species	Conservation status England	Distribution in England
Barbastelle	Vulnerable	South and central England
Serotine	Vulnerable	South and south-east of England
Nathusius' pipistrelle	Near threatened	Widespread
Common pipistrelle	Least concern	Widespread
Soprano pipistrelle	Least concern	Widespread
Brown long-eared	Least concern	Widespread
Noctule	Least concern	Widespread
Daubenton's	Least concern	Widespread
Natterer's	Least concern	Widespread
Whiskered	Data deficient	Widespread, rare
Brandt's	Data deficient	Widespread, rare
Alcaethoe	Data deficient	Widespread, rare

3.6 Breeding Birds

3.6.1 Survey Results

Appendix 2, Table 9 presents the dates, times and survey conditions recorded for each visit and Table

¹³ The Mammal Society (2020): <https://www.mammal.org.uk/science-research/red-list/>



10 provides a full list of species recorded during all six surveys. The location of notable bird species has been mapped for each survey, including information on whether the bird was singing, territory calling or only observed (Appendix 2, Figures 6–8).

In total, 45 species of bird were recorded during the survey; of these, eight species are ‘red’ listed under the Birds of Conservation Concern (BoCC) (common starling *Sturnus vulgaris*, herring gull *Larus argentatus*, house sparrow *Passer domesticus*, linnet *Linaria cannabina*, marsh tit *Poecile palustris*, mistle thrush *Turdus viscivorus*, skylark *Alauda arvensis*, yellowhammer *Emberiza citrinella*) and nine are ‘amber’ listed (bullfinch *Pyrrhula pyrrhula*, dunnoek *Prunella modularis*, grey wagtail *Motacilla cinerea*, moorhen *Gallinula chloropus*, song thrush *Turdus philomelos*, stock dove *Columba oenas*, whitethroat *Sylvia communis*, woodpigeon *Columba palumbus*, wren *Troglodytes troglodytes*). The following species recorded during the survey are also listed under Section 41 of the NERC Act (2006) or Schedule 1 of the Wildlife and Countryside Act: marsh tit, common bullfinch, common starling, skylark, yellowhammer, herring gull, linnet, red kite, firecrest *Regulus ignicapilla*, dunnoek, house sparrow and song thrush.

Additionally, a tawny owl *Strix aluco* was recorded calling on a night-time trail cam set out for the badger survey. Tawny owls have amber conservation status in the UK.

3.6.2 Pre-existing Records

The SxBRC provided bird records for a total of 59 species. Most of these species are relatively common and widespread, but the list includes 26 species of principal importance for conservation (S41 NERC Act 2006), and 13 species listed on Schedule 1 of the Wildlife and Countryside Act. In addition, 26 species are red listed on the Birds of Conservation Concern lists. Of these notable species the following are relevant to the habitats on site: bullfinch, dunnoek, song thrush, barn owl *Tyto alba*, red kite, swift *Apus apus*, lapwing *Vanellus vanellus*, herring gull, woodcock *Scolopax rusticola*, turtle dove *Streptopelia turtur*, cuckoo *Cuculus canorus*, skylark, corn bunting *Emberiza calandra*, yellowhammer, linnet, house martin *Delichon urbicum*, nightingale *Luscinia megarhynchos*, spotted flycatcher *Muscicapa striata*, marsh tit, house sparrow, wood warbler, starling and mistle thrush.

3.6.3 Interpretation

The breeding bird surveys have confirmed that the application site’s breeding bird assemblage consists largely of common and widespread species, with eight red listed species and 13 species listed under S41 or Sch1. In addition to the rarity of the species on site, the abundance is worth noting, with peak numbers of 55 woodpigeon, 40 blue tit and 17 song thrush of particular note.

Due to the size of the site, the range of habitats present and the bird species recorded, the site is considered to be important for the conservation of birds at the **local level**.

3.7 Dormice

3.7.1 Nest-tube Survey

A peak of two dormice were found at the site, both of which were recorded along the northern hedgerow boundary. A further four nests were also found along this boundary in different tubes and a starter nest was found within the southern boundary of the same field. See Appendix 2, Figure 10 for the exact



locations.

No evidence of dormice was found anywhere else on site but there is good connecting habitat and it is likely that they are present. Food caches were found but it's not possible to distinguish these from other mice, such as wood mice and yellow necked mice.

3.7.2 Pre-existing Records

The SxBRC provided 37 dormouse records in the search area. The closest of these was at 1.3 km north-east from the boundary of the site.

3.7.3 Interpretation

The site contains high value woodland, hedgerow and scrub habitat, which is well connected throughout, and is further well connected to habitat of value within the surrounding landscape.

A peak of two dormice were found during the surveys but, due to the extent of suitable habitat, the population size is likely far greater; in line with published research, population size in summer months is typically around three to five adults per ha, but up to 10 in optimal habitat (diverse deciduous woodland with abundant scrub and vigorous understorey)¹⁴. A recent study in 2018 found that the mean range-area for dormice was 0.51 ha and the mean core area was 0.09 ha¹⁵.

The current survey suggests that common dormouse is restricted to the northern hedgerow and not across the wider site, despite suitable habitat and good ecological connectivity. However, this result should be interpreted with caution and it is common best practice to assume that they could occur in any suitable habitat around a positive record, as they may use the habitat in other years or choose not to nest in the dormouse tubes in optimal habitats.

Dormice are recognised as vulnerable in the UK, though they are fairly common in many parts of the Southeast of England and there are numerous pre-existing records around Haywards Heath and other local surroundings. Based on the survey findings and the fairly restricted recorded distribution of this species within the Site, the habitats contained within the Site are considered likely important for the conservation of dormice at a local level.

3.8 Great Crested Newts and Other Amphibians

3.8.1 Habitat Suitability, eDNA Testing and Field Survey Results

Of the 32 ponds identified during the desk study, access was only granted for 11. HSI results for these ponds can be found in Appendix 2, with the exception of Pond 5, which was found to be dry.

Water samples were taken from six of the ponds (ponds 1, 3, 4, 13, 20 and 32) for eDNA analysis, with a negative result returned for all.

Presence/likely absence surveys were carried out for four of the ponds (ponds 6, 7, 8 and 9), and a

¹⁴ Bright et al (2006) The Dormouse Conservation Handbook, second edition.

¹⁵ Goodwin et al (2018) Habitat preferences of hazel dormice *Muscardinus avellanarius* and the effects of tree-felling on their movement.



small population of great crested newts was confirmed in ponds 6 and 7. Ponds 8 and 9 were dry by May and no evidence of great crested newts was found. In addition to great crested newts, smooth newt *Lissotriton vulgaris* and palmate newts *Lissotriton helvetica* were recorded in ponds 6, 7 and 8. All the survey results are detailed in Appendix 2, Table 12, 13, 14 and 15.

Common toad was recorded at Pond 6 (both adult and tadpoles) and adult common toads were recorded across the wider site (see Appendix 2, Figure 9).

3.8.2 Pre-existing Records

The SxBRC provided 258 amphibian records in the search area. This included 66 records for great crested newt, 84 records for smooth newt, 59 records for palmate newt, 32 records for common frog *Rana temporaria* and 17 records for common toad. The closest great crested newt record was 600m north of the site, dated 2020.

3.8.3 Interpretation

A small population of great crested newts has been recorded at the site. There is abundant high value terrestrial habitat for this species on site and numerous ponds of varying condition; however, the intensive arable habitat is likely the reason why the population is not thriving¹⁶.

Although targeted surveys for common toads were not undertaken, this species was recorded on site in low numbers and should be assumed present in all suitable habitat.

Based on the above, the site is considered to be important for the conservation of great crested newts at the **local level** and **likely local level** for common toad.

3.9 Reptiles

3.9.1 Survey Results

A total of 46 grass snakes were recorded at the site, with a peak of 11 grass snakes recorded during one survey (see Appendix 2, Figure 9 for the locations and Table 16 for details of the survey). No other reptiles were found.

The majority of the grass snakes were found along the northern boundary of the central field, with scattered records across the rest of the site.

3.9.2 Pre-existing Records

The SxBRC provided 69 reptile records in the search area, including 49 grass snake records, 8 adder, 7 common lizard and 5 slow worm. The closest of these was for grass snake, 180m west of the boundary of the site.

3.9.3 Interpretation

The survey findings indicate a likely 'large' population of grass snakes at the site with no other reptile

¹⁶ Piha et al (2007) Amphibian occurrence is influenced by current and historic landscape characteristics



species recorded.

Grass snakes are common and widespread species in south-east England, though numbers are thought to be declining¹⁷, and are likely to be present in most areas of suitable habitat. Based on the relatively large numbers involved and the large extent of suitable habitat at the site, the population contained within the development site is considered important to the conservation status of grass snake at the **local level**.

3.10 Riparian Wildlife

3.10.1 Survey Results

The walked river survey in April and June 2022 found no evidence of crayfish, water vole or otter.

An assessment for aquatic invertebrates was undertaken on the 18th May 2023, which identified 32 invertebrate species associated with the watercourse (see Appendix 2, section 8). The most notable species identified were the mayfly *Rhithrogena semicolorata*, which although quite common and widespread it at the eastern edge of its range. The most significant find was the giant lacewing *Osmylus fulvicephalus*, which is associated with streamside vegetation, especially in woodland.

3.10.2 Pre-existing Records

The SxBRC provided no records of otter or white clawed crayfish in the search area but did return one record for water vole, dated 2005. They also returned records for European eel *Anguilla anguilla*, bullhead *Cottus gobio*, brown trout *Salmo trutta* and brook lamprey *Lampetra planeri*, though all records were beyond 1km from the site.

3.10.3 Interpretation

Crayfish, water voles and otters are likely absent from the site and are not considered further within this report.

The assemblage of aquatic invertebrates recorded indicates that the watercourse is in a good overall condition and the sample points from locations above and below the discharge point by the sewerage treatment plant to the north indicate that this is not significantly impacting water quality, despite a noticeable effluent smell detected. The assemblage of aquatic invertebrates detected does not include any particularly rare or exciting finds, with the most notable record being the giant lacewing, however the restricted habitat availability of watercourses such as Copyhold Stream means that when identified in a healthy condition, they should be regarded to have importance for biodiversity at a **district level**.

3.11 Other Notable Species

3.11.1 Survey Results

There are habitats on site which could support brown hare, hedgehog and a variety of notable invertebrates.

¹⁷ Froglife (2023) <https://www.froglife.org/info-advice/amphibians-and-reptiles/grass-snake/>



Incidental sightings of invertebrates on site include beautiful demoiselle *Calopteryx virgo*, glow worm *Lampyrus noctiluca*, pale tussock moth *Calliteara pudibunda* caterpillar and ringlet butterfly *Aphantopus hyperantus*,

3.11.2 Pre-existing Records

The SxBRC provided 23 records for hedgehog and one record for brown hare within 2km of the site. The closest of these was for hedgehog, recorded within the site boundary in 2013.

The following higher plants have been recorded within the search area in the last 10 years:

- Hay-scented buckler-fern *Dryopteris aemula*
- Royal fern *Osmunda regalis*
- Star sedge *Carex echinate*
- Flea sedge *Carex pulicaris*
- Bladder-sedge *Carex vesicaria*
- Autumn hawkweed *Hieracium sabaudum*
- Long-leaved hawkweed *Hieracium virgultorum*
- Marsh pennywort *Hydrocotyle vulgaris*
- Bitter-vetch *Lathyrus linifolius*
- Corn mint *Mentha arvensis*
- Lesser spearwort *Ranunculus flammula*

The following notable invertebrates have been recorded within the search area in the last 10 years:

- Purple emperor *Apatura iris*
- Small heath *Coenonympha pamphilus*
- *Erynnis tages* Dingy Skipper
- White admiral *Limenitis Camilla*
- Grizzled skipper *Pyrgus malvae*
- Brown hairstreak *Thecla betulae*
- Downy emerald *Cordulia aenea*
- Common darter *Sympetrum striolatum*
- Red-green carpet *Chloroclysta siterata*
- Orange footman *Eilema sororcula*
- Chequered pearl *Evergestis pallidata*
- Alder kitten *Furcula bicuspis*
- Wainscot *Mythimna l-album*
- Common wainscot *Mythimna pallens*
- Spindle knot-horn *Nephopterix angustella*
- Grass rivulet *Perizoma albulata albulata*
- Cypress carpet *Thera cupressata*
- Sword-grass *Xylota exsoleta*
- Large sallow mining bee *Andrena apicata*
- Red-girdled mining bee *Andrena labiate*
- Four-banded flower bee *Anthophora quadrimaculata*
- Hill cuckoo bee *Bombus rupestris*



- A social wasp *Dolichovespula media*
- A solitary wasp *Gorytes laticinctus*
- Red bartsia blunthorn bee *Melitta tricincta*
- Painted nomad bee *Nomada fucata*
- Red-tailed mason bee *Osmia bicolor*
- Orange-vented mason bee *Osmia leaiana*
- Green dock beetle *Gastrophysa viridula*
- Stag beetle *Lucanus cervus*
- A long horned beetle *Poecilium alni*
- A checkered beetle *Tillus elongatus*
- Roesel's Bush-cricket *Roeseliana roeselii*
- A wolf Spider *Pardosa saltans*

3.11.3 Interpretation

The site comprises habitats, including habitat characteristic of ghyll woodland, arable field margins and grassland, which could support a number of notable plants and invertebrate species which have been recorded within the area. However, the majority of the proposed development impact area is arable farmland and improved pasture, of negligible value for these species.

Some of the species from the above list are assumed to be present, including the Roesel's bush-cricket, which is now abundant across the south-east, the common wainscot, which is found across grassland habitats and woodland rides and the stag beetle, which is found in most ancient woodland habitats where there is sufficient dead wood present. It is not possible to accurately attribute the importance of the site to each individual species

3.12 Invasive Non-native Species.

3.12.1 Survey Results

Rhododendron and cherry laurel have both been recorded on site.

3.12.2 Pre-existing Records

The SxBRC provided records for 34 invasive species within the search area, including cherry laurel, rhododendron, cotoneaster spp., Japanese knotweed *Fallopia japonica*, false acacia *Robinia pseudoacacia* and American mink *Neovison vison*.

3.12.3 Interpretation

Rhododendron and cherry laurel negatively impact biodiversity by outcompeting native species for resources such as light. The occurrences on site are restricted to a small area at present but both species thrive in the English climate and can spread with ease.

The ecological risks to the site posed by each species is significant at **site level**.



4 IMPACT ASSESSMENT

In this section, the predicted impacts and effects of the proposed scheme are described for each important ecological feature in turn. This is based on the best available information, both on the baseline ecological condition and on the method of construction, timescale and other development/planning constraints known at the time. The significance of the impact on nature conservation is recorded in accordance with CIEEM guidance and the degree of uncertainty relating to the occurrence and severity of an impact is discussed.

This assessment is based on the most up to date available plan shown on Sketch Site Plan D3012-FAB-00-XX-DR-Y-004, dated January 2023 (Figure 2).

The proposed scheme comprises redevelopment of the site to create a new community with approximately 1450 new homes. Direct impacts for the development will largely be isolated to the arable fields but will also impact areas of woodland, grassland, hedgerows and has the potential to impact the condition of Copyhold Stream.

Construction:

- direct harm from pollution, noise, lighting, vibration and the movement of people and construction machinery
- soil compaction
- habitat severance caused by construction works on-site
- habitat destruction during site clearance activities

Post construction/operation:

- permanent habitat loss;
- chronic disturbance from noise, lighting, vibration and the movement of people, vehicles on-site; risk of traffic collisions;
- increased recreational use of habitats on site and adjacent habitats, including Great Wood & Copyhold Hanger LWS, leading to soil compaction, human/dog disturbance, littering, physical damage to trees;
- increase in numbers of people and pets on site.

4.1 Designated Sites

4.1.1 Impact Characterisation

There is a footpath connecting the proposed development site with Great Wood and Copyhold Hanger LWS. The development would therefore result in direct impacts to the LWS in the form of increased recreational pressure and associated impacts including disturbance, increased dog fouling, litter and soil compaction. There is also a risk of small increases in air pollution as the proposed construction zone lies within 250m¹⁸ of the LWS.

Further, the proposed development will likely result in increased recreational pressure on Blunts and

¹⁸ Institute of Air and Quality Management (2016) Guidance on the assessment of mineral dust impacts for planning



Paiges Wood LNR (1.3 km north-east) and the three nearby LWSs, which are beyond 1km from the site boundary.

4.1.2 Significance of Effects

In the absence of mitigation, the potential impacts of the proposed development represent **possible adverse** effects on designated sites, considered to be significant at the **county** level.

4.2 *Priority Habitats*

4.2.1 Impact Characterisation

A bridge will be installed across two sections of priority habitat woodland, resulting in the loss of a small area of woodland habitat and likely a reduction in condition of the immediate surrounding area, due to shading and air pollution. A buffer of at least 20m from ancient woodland and 15m from priority habitat woodland will be implemented to avoid further impacts.

The development will largely retain the priority hedgerows on site with the exception of gaps for access roads. A total of 0.34 km of native hedgerow and 1.35 km of species-rich hedgerow will be lost through the development.

All 4.63 ha of the arable field margins will be lost.

In the absence of mitigation, the construction phase will result in significant noise and air pollution on site as well as soil compaction from machinery and materials.

The proposed development will result in increased recreational pressure during operation on all habitats accessible to the public, including the grassland in the south-east and north-east corners of the site, the woodland parcels, hedgerows and ponds.

The operational phase of the development will also result in chronic disturbance from noise and lighting, and ongoing air pollution due to an increase of vehicles on-site.

4.2.2 Significance of Effects

In the absence of mitigation, the potential impacts of the proposed development represent **possible adverse** effects on priority habitats, considered to be significant at the **local** level.

4.3 *Badgers*

4.3.1 Impact Characterisation

Due to the sensitive nature of information pertaining to badgers, this section should be omitted from the report prior to release into the public domain.

[REDACTED]



[REDACTED]

4.3.2 Significance of Effects

[REDACTED]

[REDACTED]

[REDACTED]

4.4 Bats

4.4.1 Impact Characterisation

It is understood that the proposed scheme will not affect any buildings that are known to support roosting bats or that have potential roosting features suitable for bats. Therefore, no direct impacts on bat roosts in buildings is predicted, though there are associated impact risks through losses to foraging habitats within the Core Sustenance Zone (CSZ) of roosts in these buildings.

The scheme does have potential to impact on bats roosting in trees, though no bats in trees have been found thus far. A repeat climb will be required immediately prior to any works to a tree with roost a feature(s), to confirm the absence of bats.

The proposed development has potential to result in disturbance to commuting and foraging bats, both during construction and in the long term after completion, through increased artificial lighting, disruption of commuting corridors and direct loss of natural habitats including woodland.

Some opportunities for bats may arise from the development, in the form of increased roosting opportunities within buildings and an increase in structural habitat complexity of residential areas, compared with arable habitats. The often diverse garden habitats associated with residential development, compared with the monoculture found within arable fields may lead to an increase in foraging value for more light-tolerant species associated with edge habitats, such as the common and soprano pipistrelle.

4.4.2 Significance of Effects

Bechstein's and barbastelle bats are protected under Annex II of the Habitats Directive, affording them a higher level of legislative protection than the other species of bat recorded on site. Bechstein's are



almost exclusively dependent on woodland habitat and are vulnerable to the loss of woodland habitat and tree roosts. It is thought that barbastelle's 'prefer pastoral landscapes with deciduous woodland, wet meadows and water bodies, such as woodland streams and rivers'¹⁹. Barbastelle's are vulnerable to the loss of woodland habitat and degradation of fresh water habitat. The proposed development will result in the loss of 2.05 ha of woodland habitat and, in the absence of mitigation, could result in the degradation of Copyhold Stream.

Serotine are 'vulnerable' to extinction but are well adapted to sub-urban environments, making use of woodland edge and hedgerow habitats for foraging. The inclusion of artificial roosts in the proposed buildings could result in an overall positive impact on this species.

As data is deficient on the conservation status of Alcaethoe, whiskered and Brandt's bats, it is not possible to accurately assess the impact of the proposed development on the conservation status of these species. Little is known about the ecology of Alcaethoe bats, though they are thought to be woodland specialists. Whiskered and Brandt's bats are vulnerable to the effects of modern agricultural practices and decline of woodland. The inclusion of artificial roosts in the proposed buildings could result in an overall positive impact on Whiskered and Brandt's bats.

Common and soprano pipistrelle, brown long-eared bat, noctule, Daubenton's and Natterer's bats are all common and widespread, with a conservation status of 'least concern' in England. All rely on the natural habitats on site for foraging and commuting; although common and soprano pipistrelles and brown long-eared bats will roost in buildings, Daubenton's and Natterer's rarely do and noctules are primarily tree dwellers.

Of all the above species recorded on site, roosts were only confirmed for common pipistrelle, soprano pipistrelle and brown long-eared bat.

Due to the impacts listed above, the species recorded and the confirmation of roosting/foraging/commuting, in the absence of mitigation, the potential impacts of the proposed development represent **possible adverse** effects on bats, considered to be significant at the **county** level.

4.5 Breeding Birds

4.5.1 Impact Characterisation

Without sensitive timing to works, the proposed development has the potential to result in disturbance to breeding birds, including skylark and yellowhammer, both of which are red listed and have been confirmed to be breeding on site.

The proposed development will result in the loss of arable fields, which will directly impact skylarks, and the majority of the arable field margins, which will impact yellowhammer. There will also be a small loss of woodland and hedgerow habitat. Any vegetation removal during the breeding bird season has the potential to result in the destruction of active bird nests and the killing/injury of eggs/young.

¹⁹ Bat Conservation Trust (2023):

https://cdn.bats.org.uk/uploads/pdf/About%20Bats/barbastelle_11.02.13.pdf?v=1541085170



Increased human activity during the operational phase will result in chronic disturbance to nesting birds, and the likely increase in cats at the site will likely significantly increase the predation risk.

4.5.2 Significance of Effects

In the absence of mitigation, the impacts during the construction and operational phases will have a **possible adverse** effect on birds, considered to be significant at the **local** level.

Additionally, the loss of arable fields will remove suitable breeding habitat for skylarks, resulting in a permanent significant negative effect on skylarks at the **county level**.

4.6 Common Dormice

4.6.1 Impact Characterisation

The majority of suitable dormouse habitat will be retained at the site. However, the loss of small areas of woodland and hedgerow could result in direct harm to individual dormice and a negative effect on the conservation status of this species. The current distribution of the population present is poor, with presence only identified at the northern boundary, though this species can be difficult to detect and reducing opportunities for future colonisation of the site where suitable habitat is present must also be considered.

The creation of gaps in hedgerows could result in habitat fragmentation, restricting the movement of dormice and negatively affecting the ability for the population to grow and spread to surrounding habitats. However, dormice are able to use noncorridor habitat (e.g. fields and grassland) where necessary and this doesn't present a complete barrier to movement²⁰. Furthermore, dormice have been recorded crossing roads²¹ and, though this increases the risk of road mortality²², traffic is expected to be light during the night when dormice are active, and the risk is low.

The proposed development will likely result in a significant increase in cats on site which will result in a significant increase in predation risk to dormice²³.

There is likely to be a temporary impact from noise and vibration during the construction phase and a long-term impact from light pollution during the operational phase.

4.6.2 Significance of Effects

In the absence of mitigation, the impacts will have a **likely adverse** effect on dormice considered to be significant at the **local level**.

²⁰ Bright, P.W (1998) Behaviour of specialist species in habitat corridors: dormice avoid corridor gaps

²¹ Kelm et al (2015) How often does a strictly arboreal mammal voluntarily cross roads? New insights into the behaviour of the hazel dormouse in roadside habitats

²² Sevianu et al (2022) Road mortality in Hazel Dormice (*Muscardinus avellanarius*): first evidences for this species and implications for road mortality research

²³ Woods et al (2003) Predation of wildlife by domestic cats *Felis catus* in Great Britain



4.7 Great Crested Newts and Other Amphibians

4.7.1 Impact Characterisation

Based on the survey results, the great crested newt is present in the ponds at the centre of the site, in low numbers. These ponds will not be directly impacted by the development. Common toad has also been confirmed present on site.

The development will largely impact arable land which is of low/negligible value for great crested newts and common toad, with the surrounding hedgerows and woodland largely retained. However, there will be a small loss of these high value habitats and their presence cannot be ruled out from the arable land. There is therefore a risk of killing/injury to great crested newts and common toad during the construction phase.

There will be an increase in road traffic during the operational phase which will restrict movement of great crested newts and common toad and likely result in increased mortality of these species.

The operational phase of the development will likely result in an increase of cats on site, increasing the risk of predation on great crested newts and common toad.

4.7.2 Significance of Effects

As land within 100m of a great crested breeding pond is due to be impacted by the development, harm to great crested newts is likely (see Figure 5).

As the population of great crested newts at the site is low and the majority of suitable habitat will be retained, in the absence of mitigation, the impacts will have a **possible adverse** effect on great crested newts considered to be significant at the **local level**.

The size of the common toad population at the site is unknown but is likely low as only four observations were recorded throughout the 2022 survey season (three during the reptile survey and one during a great crested newt survey). However, toad tadpoles were recorded within the central pond. As the majority of suitable toad habitat is being retained, and there is extensive similar habitat within the surrounding landscape, and as the population on site is likely small, the effect of the development is assessed as a likely adverse effect, significant at **site level**.

Component	Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	>1 ha lost or damaged	0.9
Land 100-250m from any breeding pond(s)	>10 ha lost or damaged	0
Land >250m from any breeding pond(s)	>10 ha lost or damaged	0.5
Individual great crested newts	Minor disturbance of newts	0.5
	Maximum:	0.9
Rapid risk assessment result:		RED: OFFENCE HIGHLY LIKELY

Figure 5. 'Rapid risk assessment' extracted from Natural England's great crested newt mitigation method statement template instructions²⁴.

²⁴ Available from <https://www.gov.uk/government/publications/great-crested-newts-apply-for-a-mitigation-licence>



4.8 Reptiles

4.8.1 Impact Characterisation

The majority of grass snakes were recorded along the northern boundary of the central field. As priority habitat woodland lies to the north, an appropriate buffer zone will be implemented and the field margin will be retained and enhanced to form a graded ecotone. However, disturbance levels will likely significantly increase, both during the construction phase and the operational phase, which will likely deter grass snakes from this area entirely.

Grass snakes were also recorded in the south-east corner of the site, which will be retained as grassland. However, increased recreational pressure and disturbance by dogs will likely negatively impact grass snakes here too.

4.8.2 Significance of Effects

Grass snakes are highly mobile and will quickly disperse out of harms way, and therefore the risk of direct harm to grass snakes is low. However, the development will likely deter grass snakes from large parts of the site, pushing the existing 'large' population into the surrounding habitats and the capacity for these habitats to support grass snakes is unknown.

In the absence of mitigation, the impacts will have a **possible adverse** effect on grass snakes considered to be significant at the **county level**.

4.9 Riparian Wildlife

4.9.1 Impact Characterisation

There are no anticipated impacts on crayfish, water vole or otter as these species are all presumed absent.

The assemblage of aquatic invertebrates within Copyhold Stream indicates that the watercourse is in a good condition, with a healthy mixture of species identified, though the only notable species identified were *Rhithrogone semicolorata* and giant lacewing.

The watercourses that pass through the Site will be subject to increased risk of run-off from hard standing including roads and driveways that could wash salt and hydrocarbons into the watercourse and have cumulative adverse effects on the aquatic invertebrate assemblage. There is also an increased risk of accidental or deliberate pollution of the watercourse through more human activities close by. The increase in the local residential population resulting from the Proposed Development will result in an increased loading on the existing sewage treatment works, which currently discharges into this watercourse. In the absence of upgrades to these works to cope with this increased demand, the Proposed Development could indirectly lead to deterioration in the water quality of the watercourse downstream from the treatment works. Furthermore, the increased loading irrespective of any upgrades to the capacity of the works, will result in higher volumes of water flow discharged from this sewage works, and an increase in the level of nutrients (phosphates, nitrates) and other trace contaminants (endocrine disrupters, heavy metals and detergents) that could impact on the aquatic invertebrate assemblage.



The bridge crossing the Copyhold Stream will not directly impact the watercourse, with the bridge raised on pillars, negating the need to culvert the watercourse. However, there will be risks of impact during the construction of the bridge and both during construction and the operational phases, pollution risks must be considered, including from dust, airborne pollutants and spillage risks in addition to the additional shading the bridge will create in a localised area.

4.9.2 Significance of Effects

The Copyhold Stream is a healthy watercourse, considered to be in overall good condition, given the assemblage of aquatic invertebrates present. The effluent discharge from the sewerage treatment works does not appear to be notably degrading the watercourse, despite a noticeable smell around the discharge point. Any reduction in the water quality of the stream could lead to a reduction in aquatic invertebrate populations, or indeed the loss of some species altogether.

In the absence of adequate mitigation, the potential impact of a pollution incident or harmful discharges into the watercourse during the construction or operational phases of the development would represent a **possible adverse** effect that is significant at a **district level**.

4.10 Other Notable Species

4.10.1 Impact Characterisation

The majority of habitat to be impacted by the proposed development is arable, which has low biodiversity value and notable species are unlikely to be present.

However, small amounts of woodland, arable field margin, grassland and hedgerow will be lost to the development and this could potentially negatively impact notable invertebrate and botanical species.

Based on pre-existing records, the scheme has potential to impact on European hedgehog through habitat loss and increased risk of roadkill. However, the proposed residential development and the associated mosaic of private gardens and greenspace created would, in time, become suitable for hedgehogs and offer more value than the existing arable land if designed to allow permeability of movement for this species.

In the absence of mitigation, there remains a risk of direct harm to hedgehogs during construction activities, if present on the development site. In the long term, the proposed development could result in fragmentation of hedgehog foraging and resting areas as fencing between properties could restrict the movement of hedgehogs.

4.10.2 Significance of Effects

The hedgehog has suffered dramatic declines in population in recent decades, although it remains fairly widespread and is thought to have declined less in urban areas than rural areas²⁵. There is a high degree of uncertainty of impacts occurring but as the development will largely impact arable land, of low/negligible value to hedgehogs, the proposed scheme is unlikely to result in effects that are

²⁵ Warwick, H. (2016) Britain's Hedgehogs: research and the conservation effort in the face of serious decline. British wildlife Vol. 28, pp78-86



significant beyond the **local level**.

4.11 Invasive Non-native Species

4.11.1 Impact Characterisation

If cherry laurel and rhododendron are not removed from within woodland parcel 11, there is a risk that these species will spread to other areas at the site.

Planting schemes have yet to be prepared, however, should these include ornamental invasive/non-native species (such as those listed on Schedule 9 of the Wildlife & Countryside Act, 1981) there is potential for establishment within the site and spread beyond the application site.

4.11.2 Significance of Effects

In the absence of precautionary measures, the development presents opportunity for a **possible adverse** effect on ecology at the **site level**, through the spread of invasive non-native species.

5 MITIGATION PROPOSALS

5.1 Designated Sites

5.1.1 Impact Avoidance

The proposed scheme does not result in any direct loss of designated site habitats and no specifically designed avoidance measures are necessary.

5.1.2 Mitigation Measures

Areas of publicly accessible green space will be created on site and the proposed Parkland Reserve to the north-west measuring approximately 103.21 ha will provide an alternative place for recreation to the adjacent LWS and other designated sites within the local area.

5.1.3 Residual Effects

With the implementation of the above mitigation measures, the potential for residual impacts on the adjacent LWS and designated sites within 2km is considered to reduce **to minor adverse at a District Level**.

5.1.4 Compensation Measures

To compensate for potential residual impact risks from the development on the nearby designated sites, it is recommended that appropriate financial contributions are given to the respective authorities to go towards future management.



5.2 Priority Habitats

5.2.1 Impact Avoidance

The proposed development has been designed to avoid habitat losses where possible. The two bridges through the woodland are essential and cannot be avoided; however, a 'path of least resistance' that avoids the most valuable features within the woodland (such as native mature trees) will be taken.

5.2.2 Mitigation Measures

Industry standard construction methods will be implemented to minimise the risk of pollution or release of sediments into the surrounding habitats during the construction phase. These will be set out in a Construction Environmental Management Plan (CEMP) for the Scheme, prepared during the detailed design phase.

During the construction phase, heras fencing will be used to mark out the 20 m buffer from the ancient woodland, 15 m buffer from priority woodland and 10 m buffer from all other woodland. This heras fencing will be lined with an impermeable membrane to reduce dust pollution and visual impacts on the woodland. Heras fencing will be used to mark out a minimum 4 m buffer along all hedgerows, with the majority of hedgerows protected by an 8 m buffer.

A graded ecotone of thorny scrub and tussocky grassland will be planted along the boundary of all woodland on site, to prevent public access (where there is no footpath) and deter cats and dogs.

To prevent impacts from increased recreational pressure, all ancient woodland will be fenced off from the public. The remaining woodland and greenspace will be clearly signposted with footpaths and information boards will be erected to educate the public about the sensitive habitats and notable species.

It is essential that the habitats on site are monitored in perpetuity for signs of human damage, such as littering and footfall in restricted areas. Any signs of damage must be addressed and prevented from occurring again.

The above measures shall be set out in detail through the adoption of a Landscape and Ecology Management Plan (LEMP) for the development site and secured through the planning system.

5.2.3 Residual Effects

There will be a small loss of priority habitat woodland and hedgerows that cannot be avoided.

With the adoption of impact avoidance and suitable mitigation measures it is considered that residual effects on priority habitats will be reduced to site level.

5.2.4 Compensation Measures

The lost woodland and hedgerow habitat will be replaced through planting, either on-site or in the adjacent proposed county park. Details of which are to be confirmed but no less than 10% net gain will be achieved.



5.3 Badgers

Due to the sensitive nature of information pertaining to badgers, this section should be omitted from the report prior to release into the public domain.

5.3.1 Impact Avoidance

[REDACTED]

5.3.2 Mitigation Measures

[REDACTED]

[REDACTED]

[REDACTED]

5.3.3 Residual Effects

[REDACTED]

5.3.4 Compensation Measures

[REDACTED]

5.4 Bats

5.4.1 Impact Avoidance

The majority of habitat of value for bats will be retained, though the loss of some plantation woodland is proposed and further loss and disturbance from the construction of the two proposed bridges is inevitable. There are no proposed impacts to the buildings at the centre of the site.

5.4.2 Mitigation Measures

If it is not possible to retain a tree with bat roost features, precautionary felling techniques ('soft-felling') will be used, at an appropriate time of year, or, exceptionally, may require a European Protected Species (EPS) licence if bats are clearly using the feature on a regular basis, or could be present at the



time of the works. Any trees to be felled, which have bat roost features, will be surveyed by a qualified ecologist immediately prior to commencement of works.

The proposed scheme will incorporate a 'sensitive lighting plan' developed as part of the detailed design, in accordance with guidelines set out by the Bat Conservation Trust. All woodland will be a 'no light zone' and 'dark corridors' will be created throughout the development site, along the retained hedgerows and tree belts. Any lighting required for health and safety will have features to minimize light spill onto all semi-natural habitats. All street lighting should be directed downwards and use light sources that are not attractive to insects. Reflective white line marking should be used in preference to artificial lighting in all non-essential applications.

5.4.3 Residual Effects

There will be a small loss of priority habitat woodland and hedgerows that cannot be avoided. However, this is unlikely to affect commuting and foraging bats and is not considered significant.

There will be an unavoidable loss of bat roost features due to the removal of a few trees to facilitate the development. Surveys to date have found no evidence of roosting bats in trees to date but the features will be lost all the same.

With the adoption of the above avoidance and mitigation measures, residual impacts on roosting bats are considered to be reduced to **local level**.

5.4.4 Compensation Measures

The loss of roosting features in trees will be compensated for through the incorporation of integral and external bat roost features in the buildings and on the surrounding trees. A minimum of two roosts features e.g. bat box will be installed for every one roost lost; these will be like-for-like e.g. a crevice roost will be replaced by a crevice roost feature. With these compensation measures in place, the effect of the proposed development on bats is reduced to **site level** only.

5.5 Breeding Birds

5.5.1 Impact Avoidance

Work must commence outside of the skylark breeding season (typically April to August), or only following the implementation of nesting deterrent measures and a survey that confirms the absence of active nests. Should any active nests be identified, works must be postponed until the chicks have fledged.

Any vegetation removal should only be undertaken outside of the breeding bird season (avoiding March–August inclusive). It is an offence to cause disturbance to an active nest of any bird species listed on Schedule 1 of the Wildlife and Countryside Act (1981) as amended.

5.5.2 Mitigation Measures

Small areas and single trees may be felled during the bird nesting season if all features are first searched by a suitably qualified ecologist and no active nests are found.



Heras fencing must be erected to protect all nesting bird habitat from indirect impacts such as accidental damage from machinery and to limit the amount of disturbance during the construction phase.

5.5.3 Residual Effects

The loss of suitable skylark breeding habitat cannot be avoided and will likely result in the loss of skylarks from the site.

There will be a small loss of suitable nesting bird habitat (woodland and hedgerows) and there will be an increased predation risk due to the likely increase of cats on site.

The residual effect is assessed as significant for breeding and wintering birds at a **local level**.

5.5.4 Compensation Measures

With the exception of suitable habitat for skylarks, the loss of nesting bird habitat will be adequately compensated for through the addition of nest boxes and pockets, new species-rich hedgerows and through the planting of native trees and shrubs as part of the soft landscape design for the site.

5.6 Common Dormouse

5.6.1 Impact Avoidance

The majority of suitable dormouse habitat will be retained.

5.6.2 Mitigation Measures

Based on the survey results, it is reasonable to assume that dormice may be present in all areas of woodland, scrub and tree lines where it is connected across the landscape. Since the proposed development involves removal of this habitat, a European Protected Species (EPS) licence must be obtained from Natural England for the development to legally proceed. Details of the mitigation measures will be set out in a method statement submitted with the licence application at an appropriate time before construction and habitat restoration works commence.

Where possible, vegetation removal should be strategically planned, to retain connectivity within the canopy of the woodland and across gaps in hedgerows. Where this is not possible, a specialised bridge for dormice will be installed across any gaps of more than 3m; gaps of more than 3m have been proven to present a significant barrier to dormouse movement²⁶. Details of these measures will be specified within the EPS licence.

All evidence of dormice recorded during the surveys was along the northern boundary, indicating that this hedgerow is of particular importance. To protect the hedgerow, an 8 m vegetated bund will be created and planted up with scrub, including species of high value for dormice such as hazel and honeysuckle. Thorny species will also be planted along the bund to deter cats.

²⁶ Bright, P.W (1998) Behaviour of specialist species in habitat corridors: arboreal dormice avoid corridor gaps



5.6.3 Residual Effects

The creation of gaps in hedgerows to facilitate roads, which will in turn result in increased noise and air pollution cannot be avoided. Additionally, the increased risk of predation by cats and light pollution cannot fully be mitigated. Therefore, the residual effect of the proposed development on dormice is reduced to **local level** only.

5.6.4 Compensation Measures

The 'poor' and 'moderate' condition woodland at the site will be enhanced, targeting features of value for dormice, such as improving the understory and coppicing hazel; the management plan for the woodland will be secured in a separate document. Additionally, a minimum of 50 dormouse boxes will be installed in suitable habitat across the site, away from likely disturbance by the public. With these compensation measures in place, the effect of the proposed development on dormice is reduced to **site level** only.

5.7 *Great Crested Newts and Other Amphibians*

5.7.1 Impact Avoidance

The ponds and surrounding gardens at the centre of the site are not due to be impacted by the development. However, the loss of field margins, and small areas of woodland and hedgerow cannot be avoided.

5.7.2 Mitigation Measures

The risk assessment tool provided by Natural England has determined that an 'offence is highly likely' as a result of the development and therefore an EPS licence will be required. There is presently two licensing options available for Mid Sussex that would enable lawful development. A Mitigation License may be applied for from Natural England, which would detail the mitigation measures will be set out in a method statement submitted with the licence application at an appropriate time before construction and habitat restoration works commence. Alternatively, a District License may be sought through the NatureSpace Partnership, who are the delivery partner for Mid-Sussex District Council under this licensing scheme. District Licensing takes the approach to create compensatory habitats for great crested newts at a landscape level and does not focus on intensive trapping and translocation of individual newts, though reasonable avoidance measures are applied to minimise mortality where reasonably possible. Any mitigation measures for great crested newts will also ensure mitigation for common toad.

5.7.3 Residual Effects

During the operational phase of the development, there is an increased risk of predation by cats and roadkill, resulting in a residual effect that is significant at **site level**.

5.7.4 Compensation Measures

Compensation measures will include the creation of new habitats favourable for great crested newts, to include new breeding ponds and terrestrial habitat of value for this species.



5.8 Reptiles

5.8.1 Impact Avoidance

The majority of suitable reptile habitat at the site will be retained. However, there will be an unavoidable loss of some habitats, which are of high value for grass snakes and disturbance may reduce activity in retained habitats adjacent to construction activity or subject to increased human activity.

5.8.2 Mitigation Measures

As grass snakes are a highly mobile species, fencing and translocation is not considered necessary or environmentally appropriate. Instead, a process of habitat manipulation at a suitable time of the year to encourage reptiles away from construction zones and minimise the risk of killing or injuring any individuals is proposed. Prior to commencement of works, suitable habitats for reptiles contained within the construction site should be strimmed of vegetation to ground level and all cuttings raked off and removed. This should ensure that reptiles are discouraged from the construction zone. The strimming process should be completed in two phases with the grass cut initially to a height of 10-15 cm on the first pass, to reduce the risk of harming reptiles during the strimming process and to allow any reptiles present to move away. Vegetation will either need to be maintained to below a 5 cm sward to ensure it does not become suitable for use by reptiles while the development is on-going, or could be taken back to bare ground, if this is the preferred option until the development is completed. The strimming process must be overseen by a suitably qualified ecologist.

5.8.3 Residual Effects

The development will result in chronic increase in disturbance of suitable reptile habitat at the site and will likely result in increased risk of predation by cats. The above mitigation will prevent immediate harm to grass snakes during the construction phase but the long-term effects of the development cannot be mitigated for. The remaining impacts will have a possible adverse effect on grass snakes considered to be significant at the **local level**

5.8.4 Compensation Measures

The landscape and management plan for the proposed Parkland Reserve, north-west of the site, must include targeted measures for grass snakes, including the creation of tussocky grassland, hibernacula and at least one pond.

5.9 Riparian Wildlife

5.9.1 Impact Avoidance

The bridge crossing the Copyhold Stream is set onto pillars that means there is a reduced impact to the watercourse, with the need for any culverting avoided.

5.9.2 Mitigation Measures

The control of surface drainage will be carefully managed to ensure that there is no direct runoff to the Copyhold Stream. Features to be incorporated will include Sustainable Drainage Systems (SuDS), attenuation ponds and pollution control valves. Access to the watercourse must be monitored and managed to ensure that public access is restricted. The local sewerage network will either cover the



proposed increased housing capacity, or the water company would be obliged to increase its capacity as necessary to support this development.

The construction of the bridge crossing the Copyhold Stream will need to be subject to a detailed Method Statement that ensures all construction operations are undertaken with great care and pollution control measures in place.

A monitoring programme will be put in place specifically to monitor the ecological condition of the Copyhold Stream for a specified period through the construction phase and post occupation of the development. The monitoring should be used to measure any changes in the water quality and instigate appropriate remedial action. The monitoring protocol shall be consistent with nationally recognised methods (outlined by the Environment Agency) and set out in the LEMP as secured through the planning system.

5.9.3 Residual Effects

With detailed mitigation measures in place the impact of the development upon riparian wildlife associated with the Copyhold Stream is considered **likely negligible**.

5.9.4 Compensation Measures

The removal of cultivation from the site and creation of wide woodland buffers (within which the watercourses are situated) has the potential to have a notable benefit in reducing surface runoff into the Copyhold Stream, including any associated nitrates, herbicides or pesticide residues.

5.10 Other Notable Species

5.10.1 Impact Avoidance

All excavations should be covered at night to prevent hedgehogs falling into any pits, failing that an escape mechanism should be provided to allow hedgehogs (and other wildlife) to climb out of an excavation.

5.10.2 Mitigation Measures

All new garden fencing should contain accessible gaps (10cm x 15cm) at their base to allow movement of hedgehogs between garden plots. An ecological permeability plan (showing hedgehog movement routes) should be included in the LEMP.

Road signs should be erected throughout the development, reminding people to look out for hedgehogs.

5.10.3 Residual Effects

Although there is a residual risk of increased roadkill, the creation of new interconnected garden habitats should result in a likely positive impact on hedgehogs at the site level.

5.10.4 Compensation Measures

None required.



5.11 Invasive Non-native Species

5.11.1 Impact Avoidance

Impacts resulting from non-native species will be avoided through the adoption of native planting schemes. Seed mixes and tree/shrub planting schemes will be detailed within a site-wide LEMP.

To avoid the further spread of rhododendron and cherry laurel, all specimens should be removed from the site and disposed of, following strict invasive species protocol.

5.11.2 Mitigation Measures

No specific mitigation measures are currently required.

5.11.3 Residual Effects

Following the removal of cherry laurel and rhododendron from the site, there will be a positive impact at site level.

5.11.4 Compensation Measures

None required.

6 BIODIVERSITY ENHANCEMENTS

The development will result in 20% biodiversity net gain, which surpasses the 10% gain required by the Environment Act 2021²⁷. A separate Biodiversity Impact Assessment report has been produced²⁸, detailing on-site habitat loss/enhancement and creation, as well as off-site habitat creation. This report will also ensure that all trading rules are met and that all loss of habitats on site are replaced with the same broad habitat type, with the same distinctiveness or higher.

These measures will be secured through the production of a Landscape and Ecology Management Plan (LEMP) document that sets out the number, type and location of habitat enhancements that will be provided, the on-going maintenance needs and responsibilities.

²⁷ HM Government (2021). Environment Act 2021. Available online at: <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>

²⁸ The Ecology Co-op (2023) *Biodiversity Impact Calculation, Land East of Ansty*.



7 CONCLUSIONS

A summary of the EciA process is presented in Table 7 below.

Table 7. EciA summary table

Ecological feature	Importance	Impact characterisation	Level of significance	Mitigation	Residual effects	Compensation required? (Y/N)
Blunts and Paiges Wood LNR	National	Increased recreational pressure	District	Alternative green space to be created on site and at the Parkland reserve	Likely negligible	Financial contribution to the relevant authority to aid visitor management.
Great Wood and Copyhold Hanger LWS, Pond Lye LWS, Catt's Wood Complex & Meadows LWS, The Hanger LWS	County	Increased recreational pressure	Local	Alternative green space to be created on site and at the Parkland reserve	Likely negligible	Financial contribution to the relevant authority to aid visitor management.
Priority habitats on site, including ancient woodland and hedgerows	Local	A small loss of habitat. Increased recreational pressure. Construction phase impacts such as air pollution. Operational phase impacts such as light pollution.	Local	Industry standard construction methods will be implemented to minimise the risk of pollution or release of sediments into the surrounding habitats during the construction phase. Heras fencing to mark buffers. A graded ecotone of thorny scrub and tussocky grassland will be planted along the boundary of all woodlands on site, to prevent public access (where there is no footpath) and keep cats and dogs out, all ancient woodland will be fenced off from the public. The remaining woodland and greenspace will be clearly signposted with footpaths and information boards	Site	All habitat lost will be replaced through Biodiversity Net Gain scheme the aim to achieve a positive overall outcome.



Ecological feature	Importance	Impact characterisation	Level of significance	Mitigation	Residual effects	Compensation required? (Y/N)
				will be erected to educate the public about the sensitive habitats and notable species. Habitats on site are monitored in perpetuity for signs of human damage, such as littering and footfall in restricted areas. Any signs of damage must be addressed and prevented from occurring again.		
Badgers - <u>Due to the sensitive nature of information pertaining to badgers, this section should be omitted from the report prior to release into the public domain.</u>						
Foraging and commuting bats	Regional	Increased artificial lighting, disruption of commuting corridors and direct loss of natural habitats including woodland.	County	Ecologically sensitive lighting design, including 'no light zone' and 'dark corridors'.	Local	The creation of the new Country Park will significantly improve foraging and bat roosting resources locally as an offset to on site harms caused by the development.
Roosting bats (trees)	County	Loss of trees with bat roost features. Potential direct harm to bats if roosts are occupied.	Local	If it is not possible to retain a tree with bat roost features, precautionary felling techniques ('soft-felling') will be used. Any trees to be felled, which have bat roost features, will be surveyed by a qualified ecologist immediately prior to commencement of works and EPS applied for where necessary. Sensitive lighting plan.	Local	Installation of bat roost features.



Ecological feature	Importance	Impact characterisation	Level of significance	Mitigation	Residual effects	Compensation required? (Y/N)
Roosting bats (building)	Local	No impacts to the buildings are proposed at present.	-	-	-	-
Breeding birds	Local	Loss of breeding habitat and increased predation risk by cats. All suitable skylark habitat will be lost.	Local	Appropriate Construction methods (timed outside breeding season). Heras fencing to protect bird nesting habitats during construction phase.	Local for farmland birds	Installation of nest boxes across the site. Habitat enhancements at the Parkland Reserve will offset lost habitat values at the site.
Common dormouse	Local	Direct loss of suitable habitat and habitat fragmentation. Disturbance through artificial lighting and increased recreation pressure. Increased risk of predation by cats.	Local	Mitigation for direct impacts covered by EPS licence. Biodiversity enhancements incorporated into soft landscape scheme. Ecologically sensitive lighting design.	Local	Enhance woodland at the site. Habitat losses will be compensated through new habitat creation on site and at the Parkland Reserve. A minimum of 50 dormouse boxes will be installed in suitable habitat across the site.
Great crested newts	Local	Loss of terrestrial habitat and risk of harm during construction phase and road kill risk during operational phase.	Local	Precautionary approach to construction methods – to be set out in an EPS licence.	Site	None required
Common toad	Uncertain/site	Loss of terrestrial habitat and risk of harm during construction phase and road kill risk during operational phase	Uncertain/site	Precautionary approach, as for great crested newts.	Site	None required



Ecological feature	Importance	Impact characterisation	Level of significance	Mitigation	Residual effects	Compensation required? (Y/N)
Common reptiles	Local	Loss of habitat and increased disturbance	Local	Precautionary approach to construction methods - reasonable avoidance measures and habitat manipulation.	Local	The landscape and management plan for the proposed Parkland Reserve, north-west of the site, must include targeted measures for grass snakes, including the creation of tussocky grassland, hibernacula and pond restoration.
Riparian wildlife	District	Impacts to habitat of value to aquatic invertebrate assemblage	Local	Construction best practice methods to be employed to minimise risks of sediment runoff and pollution.	Likely negligible	Increased buffers to watercourses to be established.
Other notable species: European hedgehog	Uncertain; local	Small loss of suitable habitat and risk of harm during construction phase and risk of road traffic collision during operational phase	Uncertain; local	All new garden fencing should contain accessible gaps (10cm x 15cm) at their base to allow movement of hedgehogs between garden plots.	Site	None required
Invasive non-native species	Local	Risk of cherry laurel and rhododendron spreading across the site. Risk of planting scheme introducing invasive species to the site.	Local	Adoption of native planting scheme. To avoid the further spread of rhododendron and cherry laurel, all specimens should be removed from the site and disposed of, following strict invasive species protocol.	Positive impact at site level	None required



Ecological Impact Assessment

Ansty, Haywards Heath

Appendix 1 – Method



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1 Figures

1.1 Bat surveys

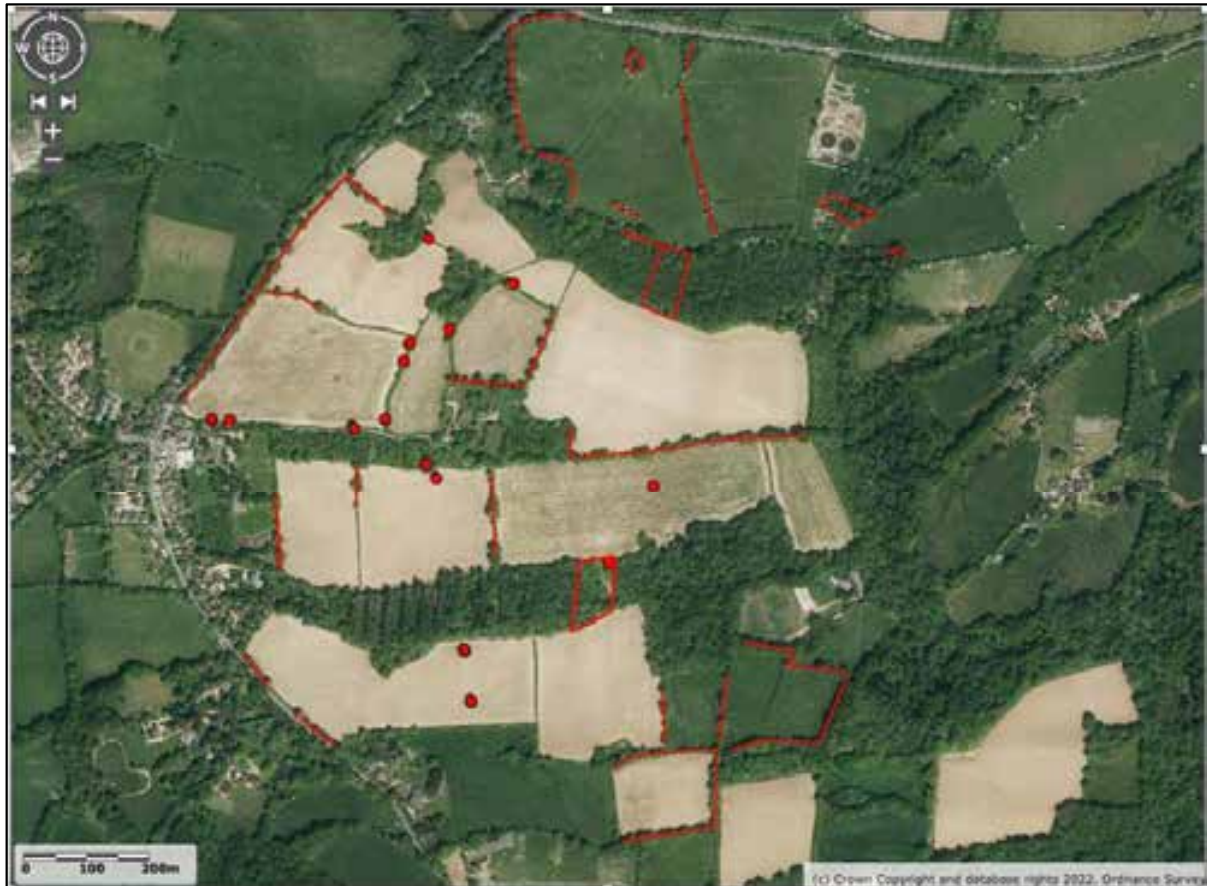


Figure 1. Ground level tree assessment: red lines/dots indicate the focus of the survey.



Figure 2. Buildings at the centre of the site which were surveyed for bat roost potential. The buildings highlighted grey were assessed as 'high' potential or were a confirmed roost. Image produced courtesy of Google maps (map data ©2022 Google).



Figure 3. An aerial image of the site, showing the positions of surveyors and infrared cameras. The surveyors and cameras were rotated across the surveys so that each position was covered at least once by either a person or a camera. A maximum of two surveyors and two cameras were used on Building 1, three surveyors and two cameras on Building 2 and two surveyors and two cameras on Building 3. Image produced courtesy of Google maps (map data ©2022 Google).

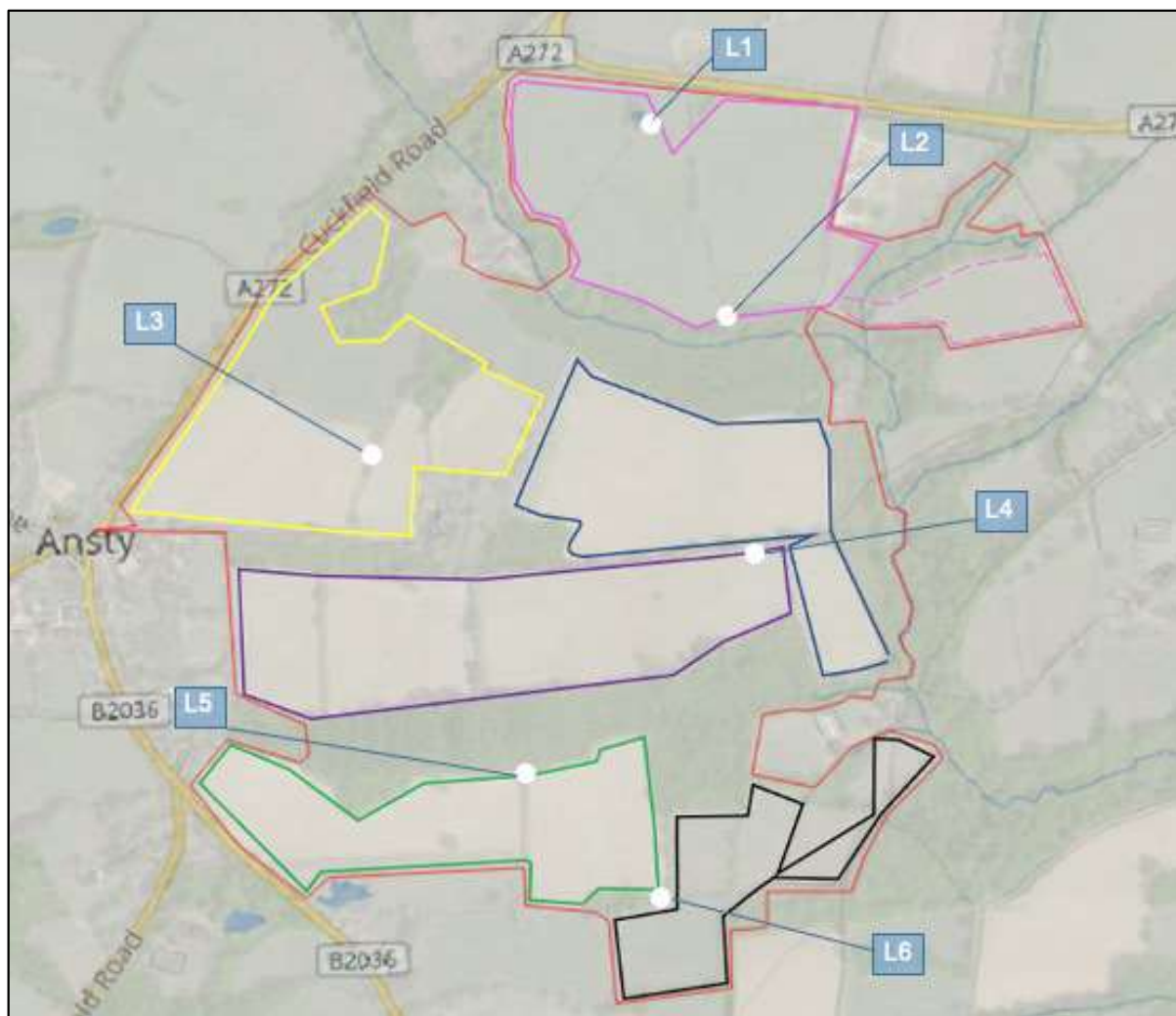


Figure 4. The transect routes of surveyors and the position of the six static bat detectors deployed on the site (white dots). The pink dash line shows the additional section walked April–June 2022. Images produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).



1.2 Breeding Bird Surveys

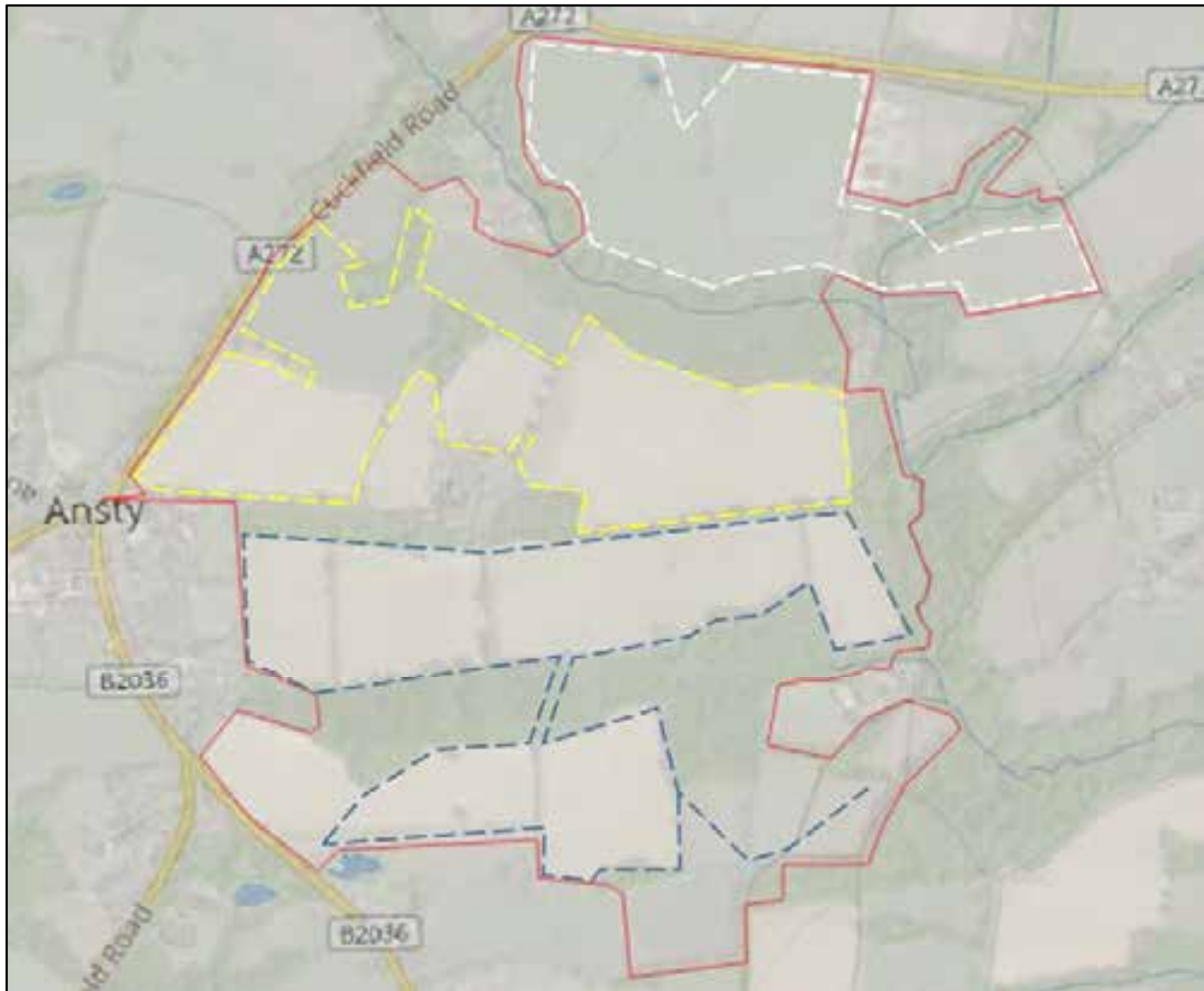


Figure 5. Breeding bird survey transect routes for the six surveys. Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).



1.3 Dormouse Surveys



Figure 6. Dormouse nest tube locations (identified as brown dots) across all suitable habitat. Image produced using QGIS.



1.4 Great Crested Newt Surveys

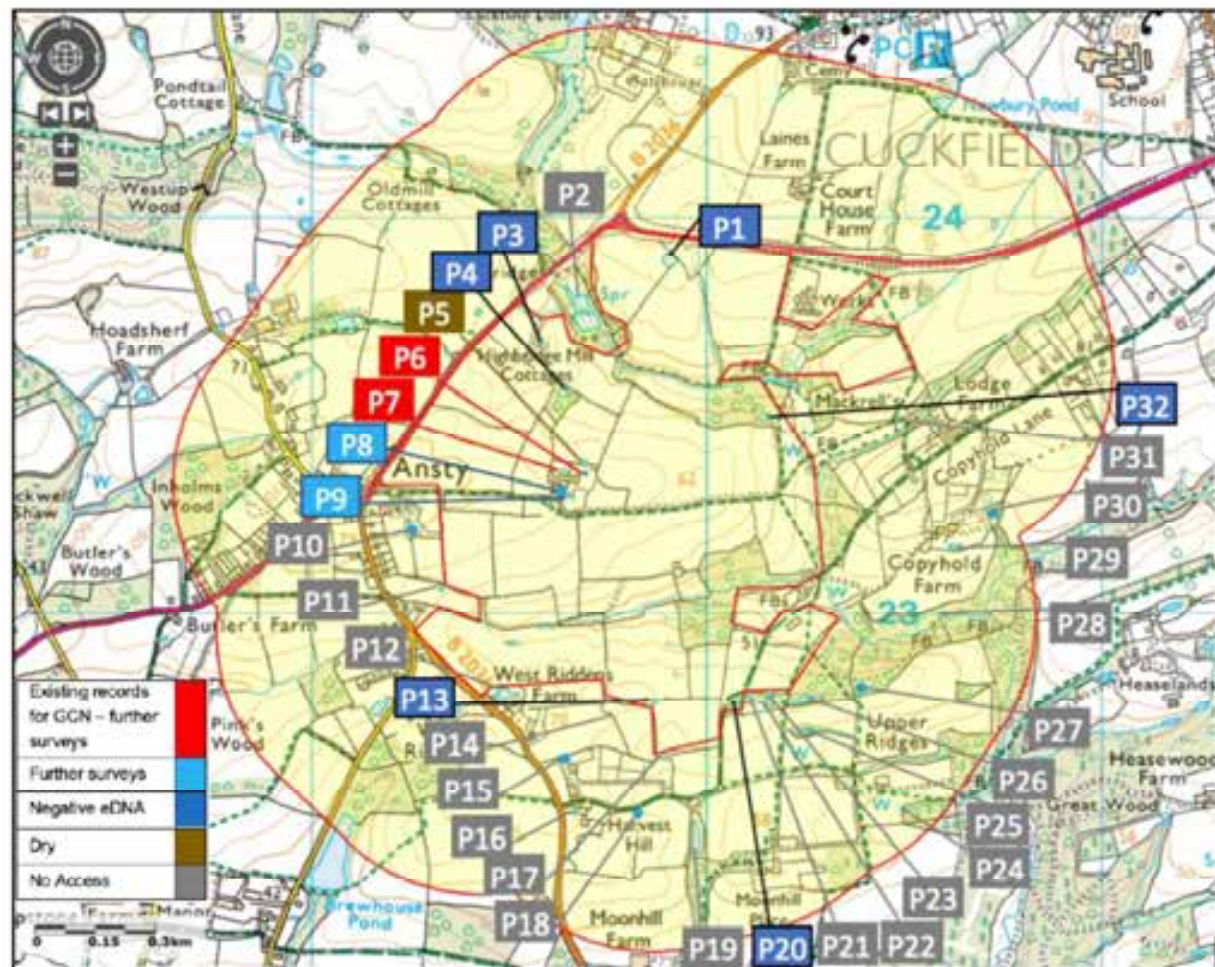


Figure 7. Ponds within the site boundary at Ansty and within a 500m radius (excluding major barriers to amphibians' movement). Existing records for great crested newts are held for Ponds 6 & 7 (highlighted red), Pond 5 (brown) was dry during all site visits, Ponds 1, 3, 4, 13, 20 and 32 (dark blue) were carried forward for eDNA. Access was not granted for all ponds highlighted grey. Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).



1.5 Reptile Surveys



Figure 8. Location of reptile refuges (identified with pink dots). Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).



2 Legislation and Policy

Introduction

The following text is intended for general guidance only and does not constitute comprehensive professional legal advice. It provides a summary of the current legal protection afforded to wildlife in general and certain species. It includes current national planning policy relevant to nature conservation.

The ‘Birds Directive’, ‘Habitats Directive’ and ‘Natura 2000 Sites’

The Council Directive 79/409/EEC on the Conservation of Wild Birds (“the Birds Directive”) sets a framework for the protection of wild birds. Under the Directive, several provisions are made including the designation and protection of ‘Special Protection Areas’ (SPAs) – areas which support important bird populations, and the legal protection of rare or vulnerable species.

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”) directs member states of the EU to take measures to maintain the favourable conservation status of important habitats and species. This requires the designation of a series of sites which contain important populations of species listed on Annex II of the Directive. Together with ‘Special Areas of Conservation’ (SACs), SPAs form a network across Europe of protected areas known as the ‘Natura 2000’.

Annex IV lists species in need of more strict protection, these are known as “European Protected Species (EPS)”. All bat species, common dormice *Muscardinus avellana*, otter *Lutra lutra* and great crested newts *Triturus cristatus* are examples of EPS that are regularly encountered during development projects.

The ‘Habitats Regulations’

The Conservation of Habitats and Species Regulations 2017, as amended (the Habitats Regulations”) is the principle means of transposing the Habitats Directive and the Birds Directive, and updates the Conservation (Natural Habitats, &c.) Regulations 1994 (“the 1994 regulations”) in England and Wales.

‘Natura 2000’ sites, now known as National Site Network sites under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, receive the highest level of protection under the Regulations which requires that any activity within the zone of influence of these sites would be subject to a Habitats Regulations Assessment (HRA) by the competent authority (e.g. planning authority), leading to an Appropriate Assessment (AA) in cases where ‘likely significant effects’ to the conservation objectives are identified.

For European Protected Species, Regulation 41 makes it a criminal offence to:

- deliberately capture, injure or kill any such animal;
- deliberately disturb wild animals of such species;
- deliberately take or destroy their eggs (where relevant);
- damage or destroy a *breeding or resting place* of such an animal;
- possess, control, sell or exchange any live or dead animal or plant, of such species;
- deliberately pick, collect, cut, uproot or destroy a wild plant of such species.

The Habitats Directive and Habitats Regulations provide for the derogation from these prohibitions for specific reasons provided certain conditions are met. An EPS licensing regime allows operations that would otherwise be unlawful acts to be carried out lawfully. Natural England is the licensing Authority and, in order to grant a license, ensures that three statutory conditions (sometimes referred to as the ‘three derogation tests’) are met:



- a licence can be granted for the purposes of “preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment” (Regulation 53 (2) (e);
- a licence can be granted if “there are no satisfactory alternatives” to the proposed action;
- a licence shall not be granted unless 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.

Wildlife and Countryside Act (1981) as amended

The Wildlife and Countryside Act (1981)¹ remains one of the most important pieces of wildlife legislation in the UK. There are various schedules to the Act protecting birds (Schedule 1), other animals including insects (Schedule 5), plants (Schedule 8), and control of invasive non-native species (Schedule 9).

Under the Wildlife and Countryside Act (WCA) 1981, all wild birds (with the exception of those listed on Schedule 2), their eggs and nests are protected by law and it is an offence to:

- take, damage or destroy the nest of any wild bird while it is in use or being built
- take or destroy the egg of any wild bird
- disturb any bird listed on Schedule 1, while it is nest building, or at a nest with eggs or young, or disturb the dependant young of any such bird.

Schedule 5 lists all non-avian animals receiving protection to a varied degree. At its strongest, the Act makes it an offence to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturb animals while occupying such places. Examples of species with *full protection* include all EPS, common reptile species, water vole *Arvicola amphibius*, white-clawed crayfish *Austropotamobius pallipes* and Roman snail *Helix pomatia*. Other species are protected from sale, barter or exchange only, such as white letter hairstreak *Satyrrium w-album*.

The Act makes it an offence to intentionally pick, uproot or destroy any plant or seed, and sell or possess any plant listed on Schedule 8. It is also an offence to intentionally uproot any wild plant not listed on Schedule 8 unless authorised [by the land owner]. Species on Schedules 5 and 8 are reviewed every 5 years when species can be added or removed.

Measures for the prevention of spreading non-native species which may be detrimental to native wildlife is included in the Act, which prohibits the release of animals or planting of plants into the wild of species listed on Schedule 9 (for example Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandifera*, New Zealand Pygmyweed *Crassula helmsii*).

The Wildlife and Countryside Act 1981 (as amended) also prohibits certain inhumane methods of traps and devices for the capture or killing of wild animals and certain additional methods such as fixed trap, poisoning with gas or smoke, or spot-lighting with vehicles for killing species listed on Schedule 6 of the Act (this includes all bat species, badger, otter, polecat, dormice, hedgehog and red squirrel).

Natural Environment and Rural Communities (NERC) Act (2006)

The NERC Act (2006)² places a statutory duty under Section 40 on all public bodies, including planning authorities, to take, or promote the taking by others, steps to further the conservation of *habitats and*

¹ Wildlife and Countryside Act (WCA) (1981). HMSO London.

² Natural Environment and Rural Communities Act (2006). HMSO London.



species of principal importance for the conservation of biodiversity in England (commonly referred to as the 'Biodiversity Duty'). This duty extends to all public bodies the biodiversity duty of Section 74 of the Countryside and Rights of Way (CROW) Act 2000, which placed a duty only on Government and Ministers. Section 41 lists the habitats and species of principle importance. This includes a wide range of species from mosses, vascular plants, invertebrates through to mammals and birds. It originates from the priority species listed under the UK Biodiversity Action Plan (UK BAP) with some omissions and additions.

Environment Act (2021)

The Environment Act sets a target of halting the decline in species through the inclusion of a legally binding 2030 species abundance target. Aiming to restore natural habitats and enhance biodiversity, the Act requires new developments to improve or create habitats for nature (through mechanisms such as mandatory Biodiversity Net Gain), and tackle deforestation. Going forwards, UK businesses will need to look closely at their supply chains as amongst other measures they will be prohibited from using commodities associated with wide-scale deforestation. Woodland protection measures are also strengthened through the Act.

The Act enables the reform of the Habitats Regulations and further improves protection for nature through the establishment of Local Nature Recovery Strategies that support national Nature Recovery Networks. In addition, the Act provides for the production of Protected Site Strategies and Species Conservation Strategies, aimed at supporting the design and delivery of strategic approaches to deliver better outcomes for nature.

Protection of Badgers Act (1992)

The Badger *Meles meles* is afforded specific legal protection in Britain under the Protection of Badgers Act (1992)³, and Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) (see above).

Under this legislation, it is a criminal offence to:

- intentionally kill, injure, take, possess, or cruelly ill-treat, a Badger, or to attempt to do so;
- interfere with a sett, by damaging or destroying it;
- to obstruct access to, or any entrance of, a badger sett; or
- to disturb a badger when it is occupying a sett.

A licence may be obtained from Natural England to permit certain prohibited actions for a number of defined reasons including interference of a sett for the purpose of development, provided that a certain number of conditions are met. Note that licenses are not normally granted for works affecting badgers between the end of November and the start of July.

National Planning Policy Framework

The National Planning Policy Framework (NPPF 2021)⁴ sets out the Government's view on how planners should balance nature conservation with development and helps ensure that Government meets its biodiversity commitments with regard to the operation of the planning system.

Paragraph 179b, which states that council policies should "*promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species;*

³ Protection of Badgers Act (1992). HMSO London.

⁴ HM Government (2021). National Planning Policy Framework. Department for Communities and Local Government. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf



and identify and pursue opportunities for securing measurable net gains for biodiversity.” The Office of the Deputy Prime Minister (ODPM) Circular 06/2005, 2005)⁵. In accordance with the NPPF, it is important that developments should contribute to and enhance the natural and local environment by:

- minimising impacts on existing biodiversity and habitats;
- providing net gains in biodiversity and habitats, wherever possible;
- establishing coherent ecological networks that are more resilient to current and future pressures.

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), published in 1994, was the UK’s response to the commitments of the Rio Convention on Biological Diversity (1992). The UK BAP was replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 to 2020 and forms the UK government’s response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. This promotes a focus on individual countries delivering target for protection for biodiversity through their own strategies.

The most recent biodiversity strategy for England, 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' was published by Defra (2011)⁶, and a progress update was provided in July 2013 (Defra 2013)⁷.

'Biodiversity 2020' builds on the Natural Environment White Paper for England – 'The Natural Choice', published on 7 June 2011, and sets out the strategic direction for biodiversity policy for the next decade.

Biodiversity 2020 deliberately avoids setting specific targets and actions for local areas because Government believes that local people and organisations are best placed to decide how to implement the strategy in the most appropriate way for their area or situation.

Birds of Conservation Concern (BoCC)

In 1996, the UK’s leading non-governmental bird conservation organisations reviewed the conservation status of all bird species in the UK against a series of criteria relating to their population size, trends and relative importance to global conservation. The lists, known as the 'Red', 'Amber' and 'Green' lists (in order of decreasing concern) are used to inform key conservation policy and decisions. The lists are reviewed every five years and are a useful reference for determining the current importance of a particular site for birds. The most recent review was undertaken in 2021⁸ (Stanbury et al, 2015), which provides an up to date assessment of the conservation status of birds in the UK.

⁵ HM Government (2005) ODPM Circular 06/05 Government Circular: *Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7692/147570.pdf.

⁶ Defra (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Available at: <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>.

⁷ Defra (2013) Progress Update. Available at: <https://www.gov.uk/government/publications/biodiversity-2020-simple-guide-and-progress-update-july-2013>.

⁸ Stanbury, A., Eaton, M., Aebischer, N., Balmer, N., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). Birds of Conservation Concern 5: the status of bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 114, pp 723-747.



3 Planning Policy: Mid Sussex District Plan 2014–2031

Table 1. An overview of the planning policy for Mid Sussex District Council

Policy Number/Title	Policy Summary
DP38 - Biodiversity	• Protect landscape for biodiversity qualities • Maintain green corridors to act as wildlife corridors Biodiversity will be protected and enhanced by ensuring development: • Contributes and takes opportunities to improve, enhance, manage and restore biodiversity and green infrastructure so there is a net gain in biodiversity including through creating new designated sites and locally relevant habitats, and incorporating biodiversity features within developments • Protects existing biodiversity, so there is no net loss of biodiversity • Unavoidable damage to biodiversity should be offset through enhancements and mitigation measures • Minimises habitat and species fragmentation and maximises opportunities to enhance and restore ecological corridors to connect natural habitats and increase coherence and resilience • Promotes the restoration, management and expansion of priority habitats in the district • Avoids damage to, protects and enhances the qualifying features of internationally designated sites of importance Designated sites will be given protection and appropriate weight according to their importance and the contribution they make to the wider ecological networks Valued soils will be protected and enhanced, including the best and most versatile agricultural land and development should not contribute to unacceptable levels of soil pollution.



4 Importance Of Ecological Features

Table 2. Determining importance of an ecological feature.

Level of importance	Criteria
International	Internationally designated site; Special Protected Area (SPA), Special Areas of Conservation (SAC), Ramsar, Biosphere Reserves; Regularly occurring population of internationally important species listed in Annex 1, 2 or 4 of the Habitats Directive and Annex 1 of the Birds Directive; A viable area of a habitat listed in Annex 1 of the Habitats Directive or area important for maintaining viability listed as in Annex 1 of the Habitats Directive; Areas outside designated sites that are important for supporting and maintaining the viability of the above designated habitats and/or species.
National	Nationally designated sites; Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Local Nature Reserves (LNR). A sufficiently large population of a species or area of habitat listed as a priority for nature conservation (S41 NERC Act) to make a significant contribution to the national conservation status (e.g. greater than 1% of the national total). A viable or regularly occurring population of a species that is nationally scarce, threatened or declining on a national scale. A habitat type that is nationally scarce, threatened or declining on a national scale.
Regional	A habitat type that is scarce, threatened or declining on a regional scale. A sufficiently large population of a species or area of habitat listed as a priority for nature conservation (S41 NERC Act) to make a significant contribution to the regional conservation status (e.g. greater than 1% of the national total).
County	Locally designated sites; Local Wildlife Sites (LWSs), Sites of Nature Conservation (SNCs) and Site of Importance for Nature conservation (SINCs). A sufficiently large population of a species or area of habitat listed as a priority for nature conservation (S41 NERC Act) to make a significant contribution to the conservation status of the species at county level (e.g. greater than 10% of the county total). A viable or regularly occurring population of a species that is rare in the county, but may be common and widespread elsewhere. For example, a population at the edge of a species' range. A habitat type that is scarce in a county but may be more frequent elsewhere.
Local/parish	Habitats and species which are scarce in the local area but are sufficiently common and widespread elsewhere that they do not meet the above criteria.
Site/negligible	Habitats with little to no ecological value (e.g. amenity grassland and hardstanding)



5 Artificial Lighting And Wildlife

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts to other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness.

Guidelines issued by the Bat Conservation Trust⁹ should be referred to when designing the lighting scheme. Note that lighting designs in very sensitive areas should be created with consultation from an ecologist and using up-to-date bat activity data where possible. The guidance contains techniques that can be used on all sites, whether a small domestic project or larger mixed-use, commercial or infrastructure development. This includes the following measures:

Avoid lighting key habitats and features altogether

There is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24-hour operation; however, in the public realm, while lighting can increase the perception of safety and security, measurable benefits can be subjective. Consequently, lighting design should be flexible and be able to fully consider the presence of protected species.

Apply mitigation methods to reduce lighting to agreed limits in other sensitive locations – lighting design considerations

Where bat habitats and features are considered to be of lower importance or sensitivity to illumination, the need to provide lighting may outweigh the needs of bats. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved. The following are techniques which have been successfully used on projects and are often used in combination for best results:

- dark buffers, illuminance limits and zonation;
- sensitive site configuration, whereby the location, orientation and height of newly built structures and hard standing can have a considerable impact on light spill;
- consideration of the design of the light and fittings, whereby the spread of light is minimised ensuring that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Consideration should be given to the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures. Consider no lighting solutions where possible such as white lining, good signage, and LED cat's eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times;
- screening, whereby light spill can be successfully screened through soft landscaping and the installation of walls, fences and bunding;
- glazing treatments, whereby glazing should be restricted or redesigned wherever the ecologist and lighting professional determine there is a likely significant effect upon key bat habitat and

⁹ Bat Conservation Trust and Institute for Lighting Professionals (2018) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



features;

- creation of alternative valuable bat habitat on site, whereby additional or alternative bat flightpaths, commuting habitat or foraging habitat could result in appropriate compensation for any such habitat being lost to the development;
- dimming and part-night lighting. Depending on the pattern of bat activity across the key features identified on site it may be appropriate for an element of on-site lighting to be controlled either diurnally, seasonally or according to human activity. A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

Demonstrate compliance with illuminance limits and buffers

- *Design and pre-planning phase*; it may be necessary to demonstrate that the proposed lighting will comply with any agreed light-limitation or screening measures set as a result of your ecologist's recommendations and evaluation. This is especially likely to be requested if planning permission is required.
- *Baseline and post-completion light monitoring surveys*; baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on key habitats and features and so may prevent the agreed or modelled illuminance limits being achieved.
- *Post-construction/operational phase compliance-checking*; as a condition of planning, post-completion lighting surveys by a suitably qualified person should be undertaken and a report produced for the local planning authority to confirm compliance. Any form of non-compliance must be clearly reported, and remedial measures outlined. Ongoing monitoring may be necessary, especially for systems with automated lighting/dimming or physical screening solutions.

Lighting Fixture Specifications

The Bat Conservation Trust recommends the following specifications for lighting on developments to prevent disturbance:

- Lighting spectra: peak wavelength >550nm
- Colour temperature: <2700K (warm)
- Reduction in light intensity
- Minimal UV emitted
- Upward light ratio of 0% and good optical control

Further reading:

Buglife (2011) A review of the impact of artificial light on invertebrates.

Royal Commission on Environmental Pollution (2009) Artificial light in the environment. HMSO, London. Available at: <https://www.gov.uk/government/publications/artificial-light-in-the-environment>

Rich, C., Longcore, T., Eds. (2005) Ecological Consequences of Artificial Night Lighting. Island Press. ISBN 9781559631297.

CPRE (2014) Shedding Light: A survey of local authority approaches to lighting in England. Available at: <http://www.cpre.org.uk/resources/countryside/dark-skies/item/3608-shedding-light>

Planning Practice Guidance guidance (2014) When is light pollution relevant to planning? Available at: <https://www.gov.uk/guidance/light-pollution>



Institution of Lighting Professionals (2021) Guidance Notes for the Reduction of Obtrusive Light GN01:2011. Available at: <https://www.theilp.org.uk/resources/free-resources/>

Voigt, C.C., Azam, C., Dekker, J., Ferguson, J., Fritze, M., Gazaryan, S., Hölker, F., Jones, G., Leader, N., Lewanzik, D. and Limpens, H., 2018. *Guidelines for consideration of bats in lighting projects*. Unep/Eurobats. Available at: https://cdn.bats.org.uk/uploads/pdf/Resources/EUROBATGuidelines8_lightpollution.pdf?v=1542109376



Ecological Impact Assessment

Ansty, Haywards Heath

Appendix 2 – Results

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1 Desk Study

Table 1. Designated sites within 2 km of the site at Ansty

Site name	Designation	Features listed on citation	Proximity	Ecological importance
Statutory Designated Sites				
Ashenground and Bolnere Woods	Local Nature Reserve (LNR)	Ashenground and Bolnere Woods LNR is a small area of ancient woodland in Haywards Heath. The woodland comprises of relic stands of hornbeam <i>Carpinus betulus</i> , hazel <i>Corylus avellana</i> and ash <i>Fraxinus excelsior</i> coppice along with oak <i>Quercus</i> sp., mature beech <i>Fagus sylvatica</i> and field maple <i>Acer campestre</i> . The woodland provides suitable habitat and food source for a range of birds with blackthorn <i>Prunus spinosa</i> , rowan <i>Sorbus aucuparia</i> , and goat willow <i>Salix caprea</i> providing insect prey.	1.3 km north-east	National
Blunts and Paiges Wood	LNR & Local Wildlife Site (LWS)	This LNR is 28.9 hectares in size and habitats include hazel coppice, mixed coppice, birch <i>Betula</i> sp. woodland, bluebell <i>Hyacinthoides non-scripta</i> woodland, meadow, grassland, pond, hedgerows and wetland area. The reserve was extended to include several meadows in June 2003	1.6 km east	National
Non-statutory Designated Sites				
Great Wood & Copyhold Hanger	LWS	This site consists mostly of a wooded ghyll valley which is ancient in origin, and several old abandoned water meadows. The ground flora is generally quite species rich and well developed, becoming increasingly so nearer the streams. The site also has particularly good fern and bryophyte communities.	Adjacent to south-east boundary	County
Pond Lye	LWS	This site includes a pond with extensive areas of sedge swamp around the margins and a species-rich neutral grassland. A number of locally uncommon plants are found in the meadow. The pond is of great ornithological importance, particularly for its breeding birds.	1.1 km north-east	County
Blunts and Paiges Wood	Local Wildlife Site (LWS)	Blunts & Paiges Woods comprise blocks of ancient and semi-natural woodland, including wet woodland along the route of a stream, and two species rich meadows located in the High Weald between Haywards Heath and Cuckfield. The site supports a diverse Lepidoptera fauna.	1.6 km east	County
Catt's Wood Complex & Meadows	LWS	This large block of woodland lies on the edge of Haywards Heath. Most of it is ancient, though only the north-east of Catt's Wood (known as Ashenground) appears to be ancient semi-natural woodland. The complex has a rich and varied ground flora. Several ungrazed meadows, just north of the woodland, are of botanical importance.	1.7 km south-east	County
The Hanger	LWS	Two main types of wood are present within this gill woodland site. Alder occurs along the streams and extends up the lower slopes in parts, with oak, hazel and ash on the upper slopes and the flat ground above. The wood supports a wide range of woodland plants, mosses and liverworts, a good	1.9 km north-west	County

		bird community and a number of uncommon butterflies.		
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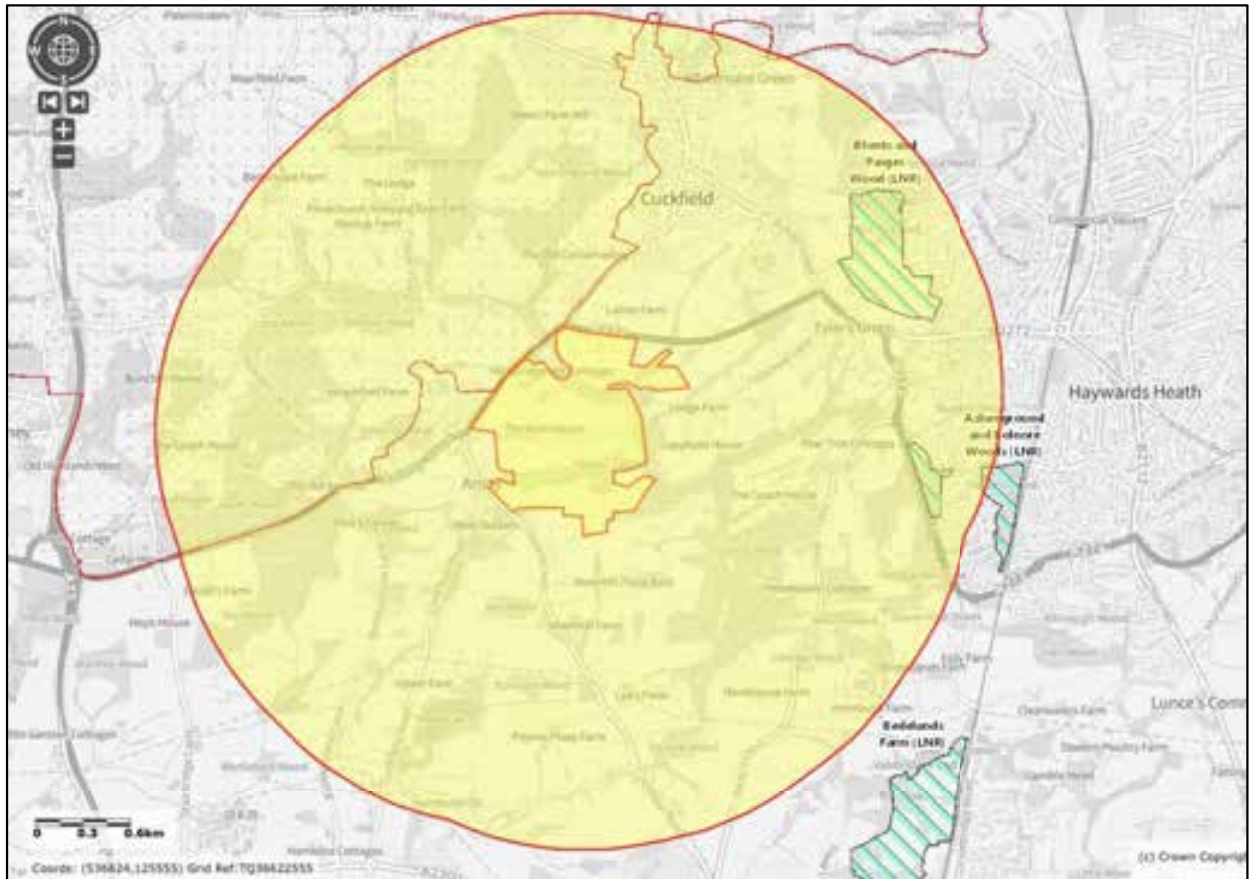


Figure 1. Statutory designated sites within a radius of 2km of the application site. Images produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).

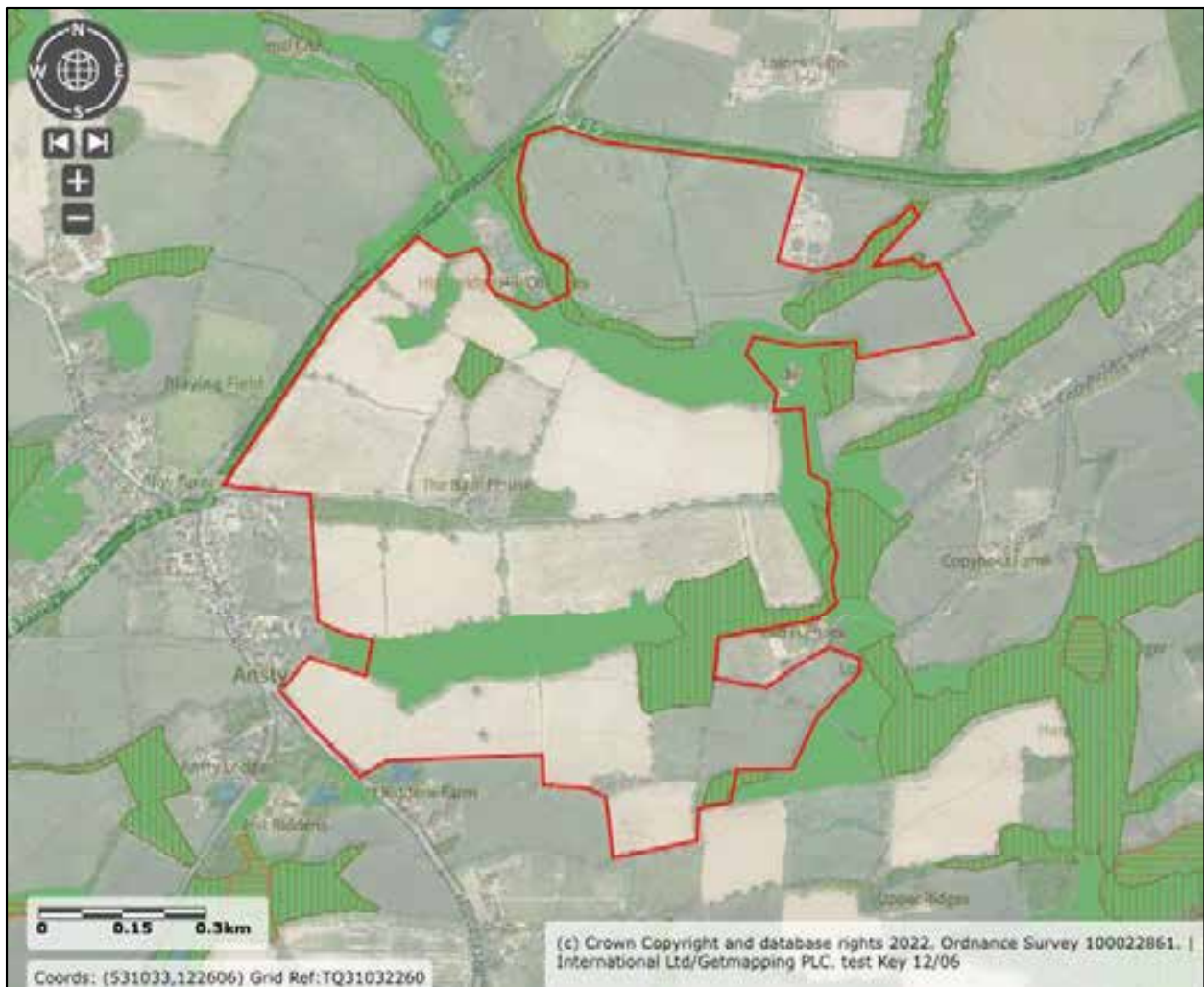


Figure 2. Ancient woodland (hash) and priority woodland (green) within the site and within the immediate surrounding area. Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>).

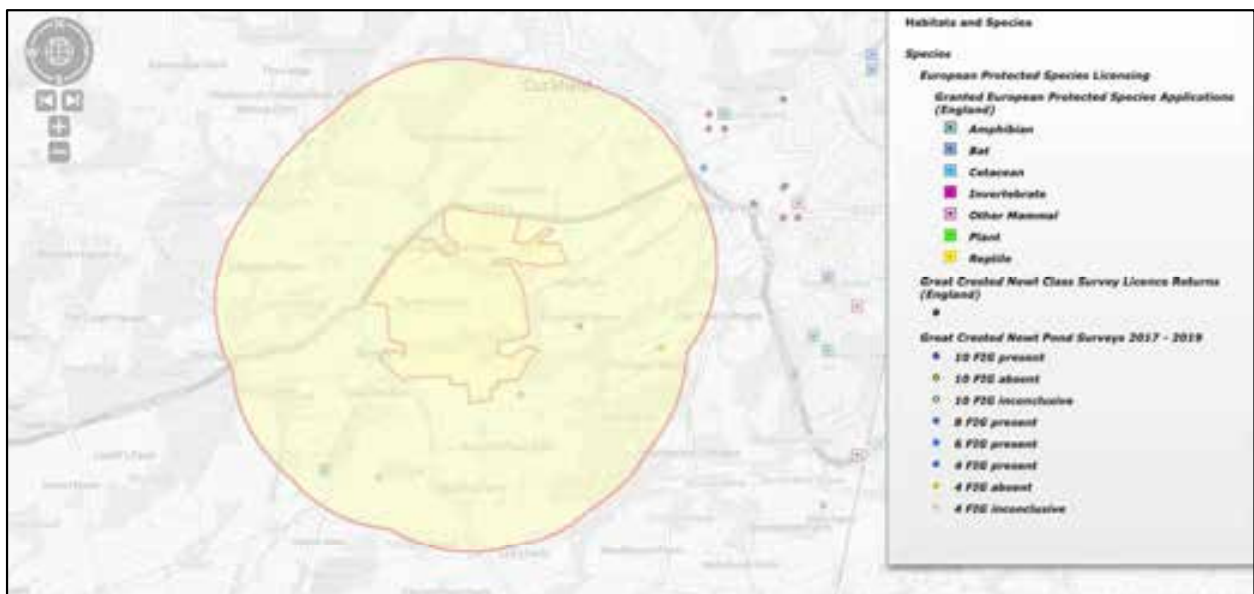


Figure 3. Granted EPS licences within 1km of the application site. Images produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).

2 Botany

Table 2. Botanical names for all common names listed within the main report

Common Name	Botanical Name	Common Name	Botanical Name
Ash	<i>Fraxinus excelsior</i>	Knapweed	<i>Centaurea nigra</i>
Bird's-foot trefoil	<i>Lotus corniculatus</i>	Lady's bedstraw	<i>Galium verum</i>
Bracken	<i>Pteridium aquilinum</i>	Lesser stitchwort	<i>Stellaria graminea</i>
Bramble	<i>Rubus fruticosus</i> agg.	Marsh cudweed	<i>Gnaphalium uliginosum</i>
Bristly oxtongue	<i>Helminthotheca echioides</i>	Marsh thistle	<i>Cirsium palustre</i>
Cleavers	<i>Galium aparine</i>	Meadow buttercup	<i>Ranunculus acris</i>
Cocksfoot grass	<i>Dactylis glomerata</i>	Meadow foxtail	<i>Alopecurus pratensis</i>
Common bent	<i>Agrostis capillaris</i>	Oak	<i>Quercus robur</i>
Common fleabane	<i>Pulicaria dysenterica</i>	Oxeye daisy	<i>Leucanthemum vulgare</i>
Common mouse-ear	<i>Cerastium fontanum</i>	Perennial ryegrass	<i>Lolium perenne</i>
Common sorrel	<i>Rumex acetosa</i>	Ragwort	<i>Senecio jacobaea</i>
Common spotted orchid	<i>Dactylorhiza fuchsii</i>	Red clover	<i>Trifolium pratense</i>
Creeping bent	<i>Agrostis stolonifera</i>	Red fescue	<i>Festuca rubra</i>
Creeping buttercup	<i>Ranunculus repens</i>	Redshank	<i>Persicaria maculosa</i>
Creeping cinquefoil	<i>Potentilla reptans</i>	Ribwort plantain	<i>Plantago lanceolata</i>
Creeping thistle	<i>Cirsium arvense</i>	Rough meadowgrass	<i>Poa trivialis</i>
Crested dog's-tail	<i>Cynosurus cristatus</i>	Round leaved fluellen	<i>Kickxia spuria</i>
Curled dock	<i>Rumex crispus</i>	Scarlet pimpernel	<i>Anagallis arvensis</i>
Cut-leaved cranesbill	<i>Geranium dissectum</i>	Scentless mayweed	<i>Tripleurospermum inodorum</i>
Dandelion	<i>Taraxacum</i> sp.	Self-heal	<i>Prunella vulgaris</i>
False oat-grass	<i>Arrhenatherum elatius</i>	Sharp leaved fluellen	<i>Kickxia elatine</i>
Field bindweed	<i>Convolvulus arvensis</i>	Smaller cat's-tail	<i>Phleum bertolonii</i>
Field forget-me-not	<i>Myosotis arvensis</i>	Smooth meadow-grass	<i>Poa pratensis</i>
Germander speedwell	<i>Veronica chamaedrys</i>	Smooth tare	<i>Vicia tetrasperma</i>
Goosefoot	<i>Chenopodium</i> sp.	Spear thistle	<i>Cirsium vulgare</i>
Grass vetchling	<i>Lathyrus nissolia</i>	Sweet vernal	<i>Anthoxanthum odoratum</i>
Greater knapweed	<i>Centaurea scabiosa</i>	Tall fescue	<i>Festuca arundinacea</i>
Greater plantain	<i>Plantago major</i>	Thyme-leaved speedwell	<i>Veronica persicaria</i>
Hard rush	<i>Juncus inflexus</i>	Trailing St John's Wort	<i>Hypericum humifusum</i>
Hedge bedstraw	<i>Galium album</i>	White clover	<i>Trifolium repens</i>
Hoary plantain	<i>Plantago media</i>	Yarrow	<i>Achillea millefolium</i>
Hoary willowherb	<i>Epilobium parviflorum</i>	Yellow rattle	<i>Rhinanthus minor</i>

Table 3. Detailed species composition of the woodland parcels at Ansty (see the main EclA report for a map of the numbered parcels).

Woodland Parcel Number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Trees																			
Alder <i>Alnus glutinosa</i>	F			R		F	O		F		R								
Ash <i>Fraxinus excelsior</i>	O			R			O		F		R			R	R	R	O	R	R
Beech <i>Fagus sylvatica</i>				R															
Bird cherry <i>Prunus padus</i>			R																
Blackthorn <i>Prunus spinosa</i>	R			R					R					O		O	O	R	O
Cherry laurel <i>Prunus laurocerasus</i>											D								
Dogwood <i>Cornus sanguinea</i>																		R	
Downy birch <i>Betula pubescens</i>			R			R													
Elder <i>Sambucus nigra</i>	R		O	R		R		R			R			O	R		O		
Field maple <i>Acer campestre</i> *				R		R										R		R	
Hawthorn <i>Crataegus monogyna</i>	O		O		R	R		R						O	R	R		R	R
Hazel <i>Corylus avellana</i>	O			F		O		R	F	O	F	O	F	F				R	
Holly <i>Ilex aquifolium</i> *	O			R		R		R	R									R	
Midland hawthorn <i>Crataegus laevigata</i> *	R																		
Oak <i>Quercus robur</i>	O			O	R				R	R	O	O		O	O	R	R	O	R
Poplar (hybrid) <i>Populus</i> sp.						D	O												
Rhododendron <i>Rhododendron ponticum</i>											O								
Small-leaved lime <i>Tilia cordata</i> *												R	O						
Sweet chestnut <i>Castanea sativa</i>			D	O															
Sycamore <i>Acer pseudoplatanus</i>													O	S					
Wild cherry <i>Prunus avium</i> *					R		R												
Wild service tree <i>Sorbus torminalis</i> *															R				
Goat willow <i>Salix caprea</i>																			O
Willow <i>Salix</i> sp.							F							R		F	O		
Plants																			
Angelica <i>Angelica sylvestris</i>	R																		
Annual meadowgrass <i>Poa annua</i>			R																
Barren strawberry <i>Potentilla sterilis</i> *	R																		
Black bryony <i>Tamus communis</i> *															R				
Bluebell <i>Hyacinthoides non-scripta</i> *	F		O	A			O		O	A	F	F		O	F				
Bluebell hybrid <i>Hyacinthoides x massartiana</i>			R	R			O												
Bramble <i>Rubus fruticosus</i> agg.	O		O	O	F	R	F		F					O		F		D	F
Broadleaved dock <i>Rumex obtusifolius</i>					O														
Bugle <i>Ajuga reptans</i>	R		R		O		R							R	R			R	
Butcher's broom <i>Ruscus aculeatus</i> *	R															R			
Cleavers <i>Galium aparine</i>	O			R	R		O								O			R	
Clustered dock <i>Rumex conglomeratus</i>																		R	
Cocksfoot grass <i>Dactylis glomerata</i>								R							R			R	
Common figwort <i>Scrophularia nodosa</i>							R	R				R							
Common nettle <i>Urtica dioica</i>	O				A		A	O				A	F	O					

Woodland Parcel Number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Common spotted orchid <i>Dactylorhiza fuchsii</i>						R													
Cow parsley <i>Anthriscus sylvestris</i>	O			R															
Creeping buttercup <i>Ranunculus repens</i>	O				A	O									R				
Creeping thistle <i>Cirsium arvense</i>					O														
Cuckoo flower <i>Cardamine pratensis</i>	O						R		O	R									
Curled dock <i>Rumex crispus</i>																R			
Dog's mercury <i>Mercurialis perennis</i>	F			R			R		F			F		F					
Early dog violet <i>Viola reichenbachiana</i> *	F								O	O									
Early purple orchid <i>Orchis mascula</i> *															R				
Enchanter's nightshade <i>Circaea lutetiana</i>	O		R	O			O												
False brome <i>Brachypodium sylvaticum</i>	R			R					R							O			
Foxglove <i>Digitalis purpurea</i>				R											R				
Germander speedwell <i>Veronica chamaedrys</i>	O						F								O				
Giant fescue <i>Schedonorus giganteus</i> *	R																		
Greater burdock <i>Arctium lappa</i>	R																		
Greater stitchwort <i>Stellaria holostea</i>	R																		
Ground ivy <i>Glechoma hederacea</i>	F		F	F	O	O	A		F	O				F	O				
Hairy woodrush <i>Luzula pilosa</i> *				R															
Hedge garlic <i>Alliaria petiolata</i>	O								R										
Hedge woundwort <i>Stachys sylvatica</i>	O			O															
Hemlock water-dropwort <i>Oenanthe crocata</i>	R						O		R										
Herb Robert <i>Geranium robertianum</i>	O								R						R			O	
Hoary willowherb <i>Epilobium parviflorum</i>					R														
Hogweed <i>Heracleum sphondylium</i>	R								R					R					
Honeysuckle <i>Lonicera periclymenum</i>	O			O					R		O				R				
Ivy <i>Hedera helix</i>			R																
Ivy-leaved speedwell <i>Veronica hederifolia</i>	O			O								O	F						
Lesser burdock <i>Arctium minor</i>														R					
Lesser celandine <i>Ficaria verna</i>	O			O			O		O	O					R				
Lords and ladies <i>Arum maculatum</i>	O				O				O			R	O	R					
Marsh marigold <i>Caltha palustris</i>							R												
Opposite-leaved golden-saxifrage <i>Chrysosplenium oppositifolium</i> *	A						R								O				
Pendulous sedge <i>Carex penudula</i> *	O																		
Primrose <i>Primula vulgaris</i> *	O			R					O	R				R					
Ramsons <i>Allium ursinum</i> *	R																		
Red campion <i>Silene dioica</i>	O		R		R	R	O		O	O				O	O				
Red currant <i>Ribes rubrum</i> *	R			R								R							
Reed canary grass <i>Phalaris arundinacea</i>	R																		
Remote sedge <i>Carex remota</i> *	O			R		R	R		O										
Rough meadowgrass <i>Poa trivialis</i>	O				O	F	O							O	O			O	
Small nettle <i>Urtica urens</i>	O																		
Soft rush <i>Juncus effusus</i>						R			R										

Woodland Parcel Number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Small sweetgrass <i>Glyceria declinata</i>						R													
Three nerved sandwort <i>Moehringia trinervia</i> *														O	O				
Town hall clock <i>Adoxa moschatellina</i> *	F						R		O	O		O		R					
Tufted hairgrass <i>Deschampsia cespitosa</i>	R																		
Valerian <i>Valeriana officinalis</i>	O																		
Violet <i>Viola sp.</i>	O						O							O	O				
Wavy bittercress <i>Cardamine flexuosa</i>	O																		
Wood anemone <i>Anemone nemorosa</i> *	F			O			O		O	F	F	O		O	F			F	
Wood avens <i>Geum urbanum</i>	R								O										
Wood dock <i>Rumex sanguineus</i>	R					F	F		R					F					
Wood meadowgrass <i>Poa nemoralis</i> *	F			O	O	F	F		F			F	F	F	O				
Wood melic <i>Melica uniflora</i> *															O				
Wood sedge <i>Carex sylvatica</i> *	O			R			R							R	O				
Wood sorrel <i>Oxalis acetosella</i> *	R			R															
Wood speedwell <i>Veronica montana</i> *	O			O			O		O			O		R	O				
Yellow archangel <i>Lamium galeobdolon</i> *	F		O	F			O		O	R		F	F	R	R				
Yorkshire fog <i>Holcus lanatus</i>					R		O							R	R				
Ferns																			
Black spleenwort <i>Asplenium adnigrum</i>	R		R							O									
Bracken <i>Pteridium aquilinum</i>			R						R					O	O				
Broad buckler <i>Dryopteris dilatata</i>	R		F	O			R			R				R					
Intermediate polypody <i>Polypodium interjectum</i>	R																		
Hard fern <i>Blechnum spicant</i> *				R						F									
Harts tongue fern <i>Asplenium scolopendrium</i>	R						R												
Lady fern <i>Athyrium filix-femina</i>	R			R															
Male fern <i>Dryopteris filix-mas</i>	R		O	R	R		O							O	R				
Soft shield fern <i>Polystichum setiferum</i> *	R								R										
Scaly male fern <i>Dryopteris affinis</i> *															R				

* Ancient Woodland Indicator

3 *Badgers*

Due to the sensitive nature of information pertaining to badgers, this section should be omitted from the report prior to release into the public domain.

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4 Bats

4.1 Natural Roost Features - Trees



Figure 4. The location of trees at Ansty assessed as having 'high', 'moderate' or 'low' bat roost potential

Table 4. Trees with potential roost features for bats

Tree ref.	Species	Age	Grid reference	Initial assessment July 2022 - all moderate/high were climbed. Ten trees/features, indicated with an * were assessed from the ground only due to safety.	Updated assessment following second/third climb in August and September 2022. Ten trees, indicated with an * were assessed from the ground only due to safety.	Feature(s)
T100	Oak	-	TQ29932 22785	High	High	Tear out, NW and NE
T24	Ash	Semi-mature	TQ 29924 22788	High	High*	Multiple woodpecker holes. The highest feature, a tear out above woodpecker holes, is inaccessible.
T30	Ash	Young	TQ 29905 22636	Moderate	High	Callous roll
T53	Poplar	Mature	TQ 30256 23641	High	High*	Large knot holes facing south-west. The highest knot hole couldn't be safely accessed
T56	Lime	Semi-mature	TQ 30267 23665	High	High	Stem wounds
T70	Oak	Mature	TQ 29996 23593	High	High	Woodpecker hole in branch
T83	Oak	Semi-mature	TQ 29322 23551	Moderate	High	Branch cavity under snapped limb, callus rolls higher in canopy
T89	Beech	Semi-mature	TQ 29227 23321	Moderate	High	Branch wound
T96	Field maple	-	TQ 29775 23483	High	High	Rot hole + butt rot
T64	Ash	Mature	TQ 29755 23739	High - Outside of site boundary	High - outside of site boundary	2 x woodpecker holes
T65	Cherry	Dead monolith	TQ 29916 23907	High - Pond and dense scrub prevent access	High - pond and dense scrub prevent access	Dead/rotten hollow stem
T34	Unknown	Dead	TQ 3004222670	High* - not safe to climb	High* - not safe to climb	Completely rotten stem
T66	Ash	Fallen mature	TQ 29895 23921	High* - not safe to climb	High* - not safe to climb	Central trunk split + rot hole
T1	Oak	n/a	TQ 29459 23185	High	Moderate	Multiple wounds / rot
T2	Oak	Veteran	TQ 29572 23256	Moderate	Moderate	Numerous knots / tears
T4	Oak	Young	TQ 29855 23269	Moderate	Moderate	Stem cavity
T20	Horse-chestnut	Semi-mature	TQ 29289 22944	Moderate	Moderate	Branch cavities
T25	Ash	n/a	TQ 29940 22786	Moderate	Moderate	Stem wound
T26	Oak	Semi-mature	TQ 29902 22650	Moderate	Moderate	Pruning scar
T49	Poplar	Dead	TQ 30309 23584	Moderate	Moderate	Stem wounds from tear outs
T72	Alder	-	TQ 29986 23533	Moderate	Moderate	3 x rot holes

Tree ref.	Species	Age	Grid reference	Initial assessment July 2022 - all moderate/high were climbed. Ten trees/features, indicated with an * were assessed from the ground only due to safety.	Updated assessment following second/third climb in August and September 2022. Ten trees, indicated with an * were assessed from the ground only due to safety.	Feature(s)
T74	Field maple	-	TQ 29487 23655	Moderate	Moderate	Rot holes
T8	Field maple	n/a	TQ 29989 23294	Moderate	Moderate	Weld
T90	Oak	Semi-mature	TQ 29259 23317	Moderate	Moderate	Flaking bark and desiccation fissure
T91	Oak	Mature	TQ 29454 23311	Moderate	Moderate	Knot hole
T99	Sycamore	Semi-mature	TQ 29626 23388	High	Moderate	Very large tear out and cavity
T19	Oak	Dead	TQ 29870 23096	Moderate* - not safe to climb	Moderate* - not safe to climb	Flaking bark
T37	Oak	n/a	TQ 3007722961	Moderate* - not safe to climb	Moderate* - not safe to climb	Lifted bark
T63	Ash	Mature	TQ 29793 23724	Moderate* - not safe to climb	Moderate* - not safe to climb	Dead limb + rot hole
T93	Dead tree	-	TQ 29611 23467	Moderate* - not safe to climb	Moderate* - not safe to climb	Flaking bark
T43	Oak	-	TQ 30246 22912	Low	Low	Crevices in branch snap
T29	Unknown	Dead	TQ 29896 22633	Low	Low	Woodpecker hole
T22	Horse-chestnut	Mature	TQ 29320 22901	Moderate	Low	Branch cavity
T28	Ash	Semi-mature	TQ 29889 22634	High	Low	Woodpecker hole
T3	Ash	Semi-mature	TQ 29806 23263	High	Low	Woodpecker hole
T32	Ash	Semi-mature	TQ 30013 22669	High	Low	Large callous rolls and stem cavities
T36	Oak	n/a	TQ 30047 22810	Moderate	Low	Tear out
T42	Oak	-	TQ 30221 22925	Moderate	Low	Hole in branch break
T46	Poplar	Mature	TQ 30325 23595	Moderate	Low	Branch wound with gap behind dead-wood plate (S facing)
T52	Lime	Decline	TQ 30269 23646	High	Low	Failed limb with decayed hole
T61	Mature ash	Mature	TQ 29796 23682	Moderate	Low	Knot hole + tear out
T75	Field maple	-	TQ 29492 23668	High	Low	Rot holes
T76	Oak	Semi-mature	TQ 29482 23677	Moderate	Low	Pruning scar
T79	Lime	Semi-mature	TQ 29415 23680	Moderate	Low	Rot hole in stem and branch cavity

Tree ref.	Species	Age	Grid reference	Initial assessment July 2022 - all moderate/high were climbed. Ten trees/features, indicated with an * were assessed from the ground only due to safety.	Updated assessment following second/third climb in August and September 2022. Ten trees, indicated with an * were assessed from the ground only due to safety.	Feature(s)
T84	Oak	Mature	TQ 29335 23524	Moderate	Low	Dead limbs, flaking bark and knot hole
T9	Oak	Semi-mature	TQ 29992 23291	Moderate	Low	Transverse split
T92	Oak	Semi-mature	TQ 29534 23417	Moderate	Low	Branch cavity and knot hole
T95	Ash	-	TQ 29717 23533	Moderate	Low	Callous rolls and stem cavity
T10	Oak	n/a	TQ 30009 23288	Low	Low	Gaps around pruning wound
T11	Oak	Semi-mature	TQ 30030 23301	Low	Low	Hazard beam
T12	Oak	Mature	TQ 30090 23301	Low	Low	Transverse snap
T13	Oak	n/a	TQ 30134 23304	Low	Low	Deadwood/fissure cavity
T14	Beech	n/a	TQ 30165 23308	Low	Low	Rot hole in stem
T15	Oak	n/a	TQ 30175 23302	Low	Low	Snapped limb
T17	Oak	Semi-mature	TQ 29679 23176	Low	Low	Stem cavity
T18	Oak	Semi-mature	TQ 29680 23159	Low	Low	Tear out
T21	Lime	Semi-mature	TQ 29304 22916	Low	Low	Crack in branch
T27	Oak	Semi-mature	TQ 29928 22654	Low	Low	Pruning scar
T31	Field maple	n/a	TQ 29911 22635	Low	Low	Frost cracks and callousing
T33	Oak	Semi-mature	TQ 30028 22667	Low	Low	Branch cavity
T35	Oak	Semi-mature	TQ 30025 22735	Low	Low	Split/snapped limb
T38	Oak	n/a	TQ 30090 22959	Low	Low	Lifted bark
T39	Oak	n/a	TQ 30107 22953	Low	Low	-
T40	Oak	n/a	TQ 30148 22952	Low	Low	-
T41	Ash	-	TQ 30161 22923	Low	Low	-
T44	Oak	-	TQ 30092 22801	Low	Low	Small branch cavity
T45	Poplar	Mature	TQ 30319 23595	Low	Low	Branch wound
T47	Poplar	Mature	TQ 30329 23593	Low	Low	Branch wound (facing ground/north)
T48	Poplar	Mature	TQ 30332 23585	Low	Low	Branch wound (facing north-east)

Tree ref.	Species	Age	Grid reference	Initial assessment July 2022 - all moderate/high were climbed. Ten trees/features, indicated with an * were assessed from the ground only due to safety.	Updated assessment following second/third climb in August and September 2022. Ten trees, indicated with an * were assessed from the ground only due to safety.	Feature(s)
T5	Oak	Semi-mature	TQ 29904 23262	Low	Low	Hazard beam
T50	Oak	Mature	TQ 30287 23651	Low	Low	Gaps around deadwood
T57	Blackthorn	n/a	TQ 30028 23639	Low	Low	Subsidence crack
T58	Crack willow	Mature	TQ 29996 23785	Low	Low	Transverse snap
T59	Crack willow	Mature	TQ 29998 23792	Low	Low	Various ground level fissures
T6	Oak	Semi-mature	TQ 29921 23268	Low	Low	Branch cavity
T60	Ash	Mature	TQ 29987 23879	Low	Low	Ivy cover and signs of dieback
T62	Oak	Mature	TQ 29807 23686	Low	Low	Flaking bark
T67	Hawthorn	Mature	TQ 29895 23665	Low	Low	Transverse snap
T68	Hazel	Semi-mature coppiced	TQ 29947 23591	Low	Low	Transverse snap
T69	Alder	Semi-mature	TQ 29934 23611	Low	Low	Flaking bark
T7	Field maple	n/a	TQ 2997823290	Low	Low	Fissures
T71	Alder	-	TQ 29982 23554	Low	Low	Callus rolls
T73	Alder	-	TQ 29965 23512	Low	Low	Rot hole
T77	Oak	Mature	TQ 29462 23693	Low	Low	Snapped limb
T80	Oak	Mature	TQ 29385 23648	Low	Low	Desiccation fissures
T81	Oak	Semi-mature	TQ 29334 23573	Low	Low	Flaking bark and splintering wood
T82	Lime	Semi-mature	TQ 29322 23563	Low	Low	Stem cavity
T86	Field maple	-	TQ 29226 23412	Low	Low	Snapped stem
T88	Sycamore	Young	TQ 29206 23380	Low	Low	Vertical crack
T94	Oak	Mature	TQ 29704 23540	Low	Low	Pruning wound
T97	Oak	Semi-mature	TQ 29760 23439	Low	Low	Several snapped limbs
T98	Ash	Young	TQ 29688 23377	Low	Low	Knot hole
T16	Oak	Semi-mature	TQ 29672 23196	Moderate	Negligible	Stem cavity
T23	Horse-chestnut	Semi-mature	TQ 29367 22847	Moderate	Negligible	Pruning wounds

Tree ref.	Species	Age	Grid reference	Initial assessment July 2022 - all moderate/high were climbed. Ten trees/features, indicated with an * were assessed from the ground only due to safety.	Updated assessment following second/third climb in August and September 2022. Ten trees, indicated with an * were assessed from the ground only due to safety.	Feature(s)
T51	Oak	Mature	TQ 30284 23656	Moderate	Negligible	Hazard beam on dead branch
T54	Alder	Mature	TQ 30238 23655	Moderate	Negligible	Branch wound (obscured from view)
T55	Oak	Mature	TQ 30260 23663	Moderate	Negligible	Gap behind deadwood plate in canopy, multiple fissures lower down
T78	Field maple	-	TQ 29448 23706	Moderate	Negligible	Branch cavity
T85	Oak	Mature	TQ 29392 23498	High	Neg Negligible	Wound on underside of limb + callus rolls
T87	Ash	Mature	TQ 29222 23404	Moderate	Negligible	Possible branch cavity with callus rolls

4.2 Built Structures – Roost Appraisal

Table 5. Potential roost features for bats in buildings

Building	Description of features	Assessment	
1	A residential building, approximately 400 years old, in moderate condition. The roof comprises clay tiles and is pitched and hipped, with a catslide on the western elevation. Stone walls with weatherboarding present on western and eastern elevations. Multiple gaps under clay roof tiles on all elevations and gaps behind the weatherboarding on the eastern elevation. There is an exposed timber frame on the western elevation, with small gaps between external frame and brick on south-east corner. There is one internal roof void which is in use for storage and has a boarded floor. No evidence of bats was found within the void.	High potential	Front:  Back: 
2	A residential building, approximately 500 years old, in moderate condition. A pitched, hipped and cross gabled roof with multiple gaps under clay roof tiles and clay hanging tiles. Small gaps at the eaves into the roof void. Exposed timber frame with gaps. The building contains one roof void and one cellar. There is a gap in the chimney brickwork, allowing access into the chimney stack. Bat droppings were found throughout the roof void, in large concentrations in places. No evidence of bats was recorded in the cellar.	Confirmed roost	 
3	Brick walled garage with clay tiled pitched, hipped roof. Gaps are present under the roof tiles on all elevations and there are some missing/slipped tiles. Weatherboarding on the north and south elevation, with some gaps recorded. Gaps at the eaves, allowing access inside to a void that is open to the apex. A handful of droppings were recorded inside.	Confirmed roost	
4	This single storey 'outbuilding' is connected to Building 1 and is currently in use for storage. The roof is pitched and hipped on the eastern elevation, with multiple gaps noted under the clay tiles. The roof is lined internally by bitumen and is open to the apex. No evidence of bats was seen.	Moderate potential	

Building	Description of features	Assessment	
5	Outbuilding in use for storage. Cross gabled with catslide roof. Gaps under roof tiles on all elevations and gaps around the door, allowing access inside. No evidence of bats recorded.	Low potential	
6	Small outbuilding in use for storage. Pyramid hip roof with gaps present under roof tiles on all elevations. No evidence of bats recorded.	Low potential	
7	Converted barn into garage and office space. Pitched and half hipped roof. Gaps under clay roof tiles on all elevations and small gaps behind weatherboarding. No access inside. No evidence of bats recorded.	Moderate potential	
8	Residential modern barn conversion in good condition. Pitched, hipped and flat roof. Gaps under clay roof tiles on all elevations and small gaps behind weatherboarding. No internal roof void. No evidence of bats recorded. Some parts of the building were difficult to assess due to surrounding vegetation.	Moderate potential	
9	Open sided outbuilding with multiple gaps under that clay tiles of the pitched and hipped roof. No evidence of bats recorded.	Moderate potential	
10	Open sided outbuilding in use for storage and as a car port. Gaps under the clay roof tiles on all elevations. No evidence of bats recorded.	Moderate potential	

4.3 Emergence Surveys

Table 6. Details of the emergence surveys for buildings 1–3, including timings, weather conditions and personnel.

Date	Survey start time/end time	Temp. degrees centigrade, weather conditions throughout survey	Surveyors
Building 1: The Barn			
01/08/22	Start time: 20:27 Sunset: 20:47 End time: 22:17	Max/min temp: 19–18°C. 80-100% cloud cover and still air (BF0)	Kate Lewis Federico Ghittoni
23/08/22	Start time: 19:36 Sunset: 20:06 End time: 21:36	Max/min temp: 20–19°C. 100% cloud cover and still air (BF0)	Kate Lewis Julian Browning
03/09/22	Start time: 19:08 Sunset: 19:38 End time: 21:08	Max/min temp: 20–18°C. 60-90% cloud cover and light breeze (BF2)	Kate Lewis Julian Browning
Building 2 & 3: Old Place			
26/07/22	Start time: 20:26 Sunset: 20:56 End time: 22:26	Max/min temp: 19–16°C. 40-80% cloud cover and light air (BF1)	Dan Bennett Nik Neale Aaran hart Bella Friar Rebecca Mortensen
09/08/22	Start time: 20:10 Sunset: 20:33 End time: 22:03	Max/min temp: 20–18°C. 5-0% cloud cover and light air (BF1)	Kate Lewis Tom Francis James Whitby Rebecca Mortensen Aaron Hart
31/08/22	Start time: 19:30 Sunset: 19:48 End time: 21:18	Max/min temp: 18–16°C. 5-10% cloud cover and light air (BF1)	Kate Lewis Tom Francis Sophie Bradfield Patrick Kitchenor Xenia Snowman

Emergence survey results

Building 1, The Barn:

- 01/08/22
No emergences were recorded and general activity was very low with only one or two passes recorded for common pipistrelle, soprano pipistrelle, brown long-eared and a myotis species.
- 23/08/22
A common pipistrelle and a soprano pipistrelle were recorded emerging from the eave on the eastern elevation.
Foraging common pipistrelles were recorded throughout the survey. A low number of passes for soprano pipistrelle, noctule and a myotis species were also recorded.
- 03/09/22
A common pipistrelle was recorded emerging from a roof tile on the eastern elevation.
General activity was low for soprano pipistrelle, noctule and a myotis species, with moderate foraging activity for common pipistrelle.

Building 2, Old Place:

- 26/07/22
A look inside the loft void before the survey found a single brown long-eared bat in the void at the northern gable end.
Three soprano pipistrelles and three common pipistrelles were recorded emerging from hanging tiles on the southern elevation. A brown long-eared bat was recorded re-entering a crevice near the front door at 21:36.

Two common pipistrelles were recorded emerging from hanging tiles on the eastern elevation and a soprano pipistrelle was recorded emerging from a gap in the chimney stack on the eastern elevation.

A soprano pipistrelle was recorded emerging from hanging tiles on the northern elevation and a brown long-eared bat emerged from the eave on the north-west elevation.

General activity was low, with only a few passes recorded for common pipistrelle, soprano pipistrelle, noctule, a myotis species and brown long-eared.

- 09/08/22

Southern elevation: Eight common pipistrelles and two soprano pipistrelles emerged from hanging tiles.

Eastern elevation: One soprano pipistrelle and one common pipistrelle emerged from the eaves.

Western elevation: One common pipistrelle emerged from a hanging tile. Another bat was caught on camera emerging from a hanging tile at 20:57 which, due to the size, flight pattern and time of emergence, was likely a pipistrelle.

General activity: moderate foraging by soprano and common pipistrelle. Low activity for serotine, noctule and a myotis species.

- 31/08/22

A bat was recorded on camera emerging from a hanging tile on the western elevation at 20:23. At the same time a myotis echolocation was detected by a nearby surveyor.

General activity was high for common and soprano pipistrelle foraging and social calling. One or two passes recorded for myotis and brown long-eared bats.

Building 3, Old Place Outbuilding

- 26/07/22

A non-echolocating bat emerged from the south-east eave at 33 minutes after sunset.

Seven brown long-eared bats were caught on camera emerging from the south-west eave.

General activity was as of that for Building 2 (see above).

- 09/08/22

A single brown long-eared bat emerged from the eave on the eastern elevation.

General activity was as of that for Building 2 (see above).

- 31/08/22

No emergences recorded. General activity was as of that for Building 2 (see above).

Trees T19, 24, 37, 53, 63, 66 and 93

Date	Survey start time/end time	Temp. degrees centigrade, weather conditions throughout survey	Trees Surveyed
02/05/23	Start time: 19:53 Sunset: 20:23 End time: 21:53	Max/min temp: 9–14°C. 0% cloud cover and light breeze (BF2)	T24, T34, T53, T66
25/05/23	Start time: 20:27 Sunset: 20:57 End time: 22:27	Max/min temp: 10–13°C. 0% cloud cover and light breeze (BF2)	T24, T34, T53, T66
05/06/23	Start time: 20:45 Sunset: 21:09 End time: 22:39	Max/min temp: 11–14°C. 0% cloud cover and very light breeze (BF1)	T19, T37, T63, T93
06/06/23	Start time: 20:40 Sunset: 21:10 End time: 22:40	Max/min temp: 13°C. 80% cloud cover and very light breeze (BF1)	T24, T34, T53, T66
22/06/23	Start time: 20:49 Sunset: 21:19 End time: 22:49	Max/min temp: 18–20°C Clear and light breeze (BF2)	T19, T37, T63, T93

No bat emergences were identified by the surveyors or from subsequent night-vision camera footage review.

A summary of bat activity can be provided upon request, though no activity identified was found to differ from general activity recorded and identified in Section 4.4.

4.4 Bat Activity Surveys – Walked Transects

Table 7. Walked transect metadata: dates, times, temperature, weather conditions.

Date	Survey start time/end time	Temp. degrees centigrade, weather conditions	Surveyors
20/04/22	20:04 - 22:04 Sunset: 20:04	Start temp.: 12°C 10% cloud cover, BF2, dry.	Kate Lewis James Whitby Nick Bayne Patrick Kitchenor Sophie Bradfield Xenia Snowman
23/05/22	20:54 - 22:54 Sunset: 20:54	Start temp.: 12°C 10% cloud cover, BF1, dry.	Kate Lewis James Whitby Nik Neale Rebecca Mortensen Dan Bennet Federico Ghittoni Xenia Snowman
22/06/22	21:19 - 23:19 Sunset: 21:19	Start temp.: 18°C 0% cloud cover, BF0, dry.	Kate Lewis Julian Browning Nick Bayne Patrick Kitchenor Sophie Bradfield Sam Lunn Rebecca Mortensen
21/07/22	21:04 - 23:04 Sunset: 21:04	Start temp.: 21°C 80% cloud cover, BF0, dry.	Kate Lewis Ryan Walker Tom Francis Patrick Kitchenor Sophie Bradfield Chris Drake
17/08/22	20:18 - 22:18 Sunset: 20:18	Start temp.: 20°C 20% cloud cover, BF0, dry.	Kate Lewis James Whitby Nick Bayne Patrick Kitchenor Sophie Bradfield Chris Drake
20/09/22	19:04 - 21:04 Sunset: 19:04	Start temp.: 14°C 80% cloud cover, BF0, dry.	Kate Lewis Paul Stevens Nick Bayne Tom Francis Josh Blackman Federico Ghittoni

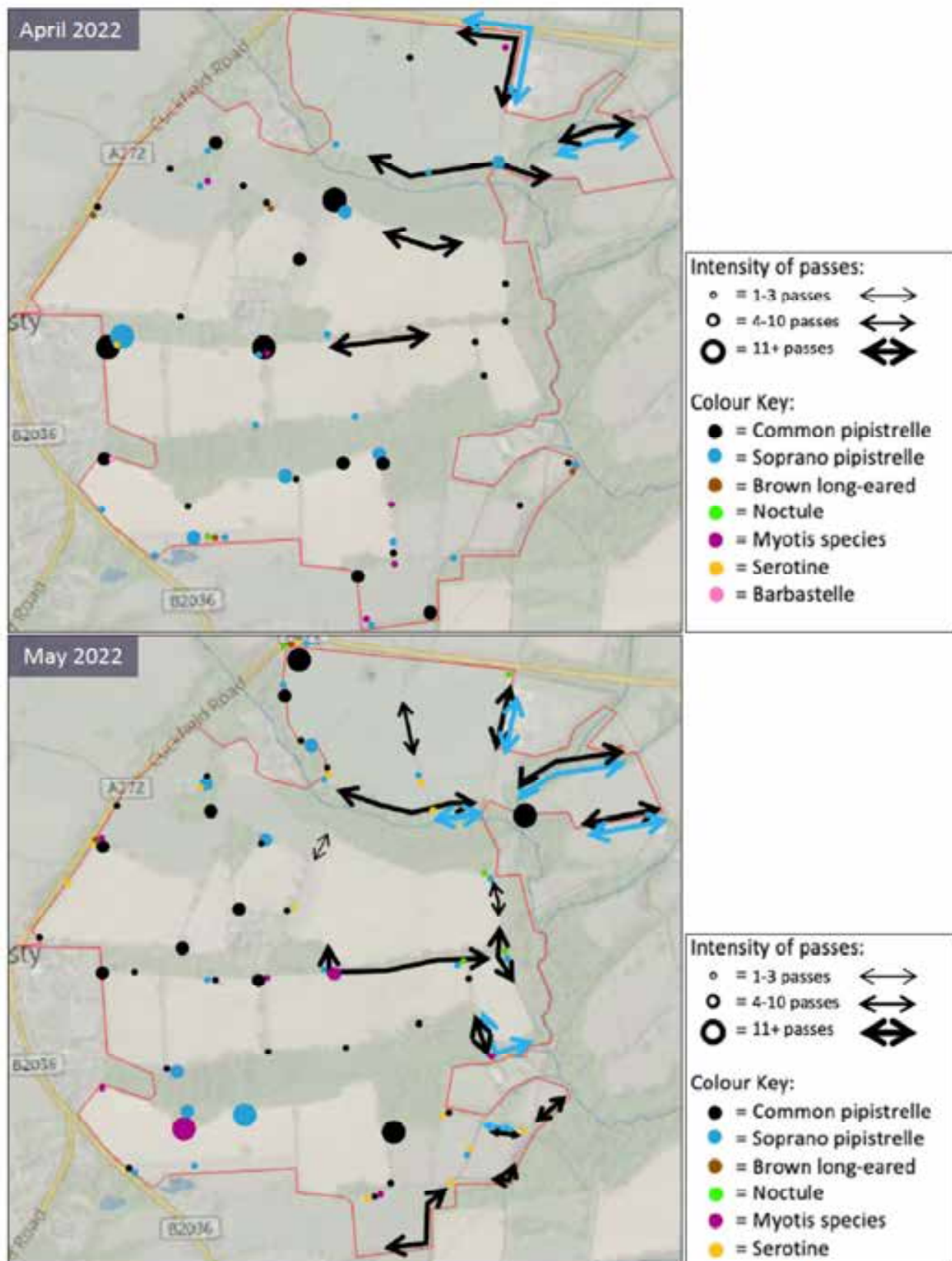


Figure 5. Approximate distribution of bats detected during each walked transect survey in April and May 2022. Images produced using QGIS.

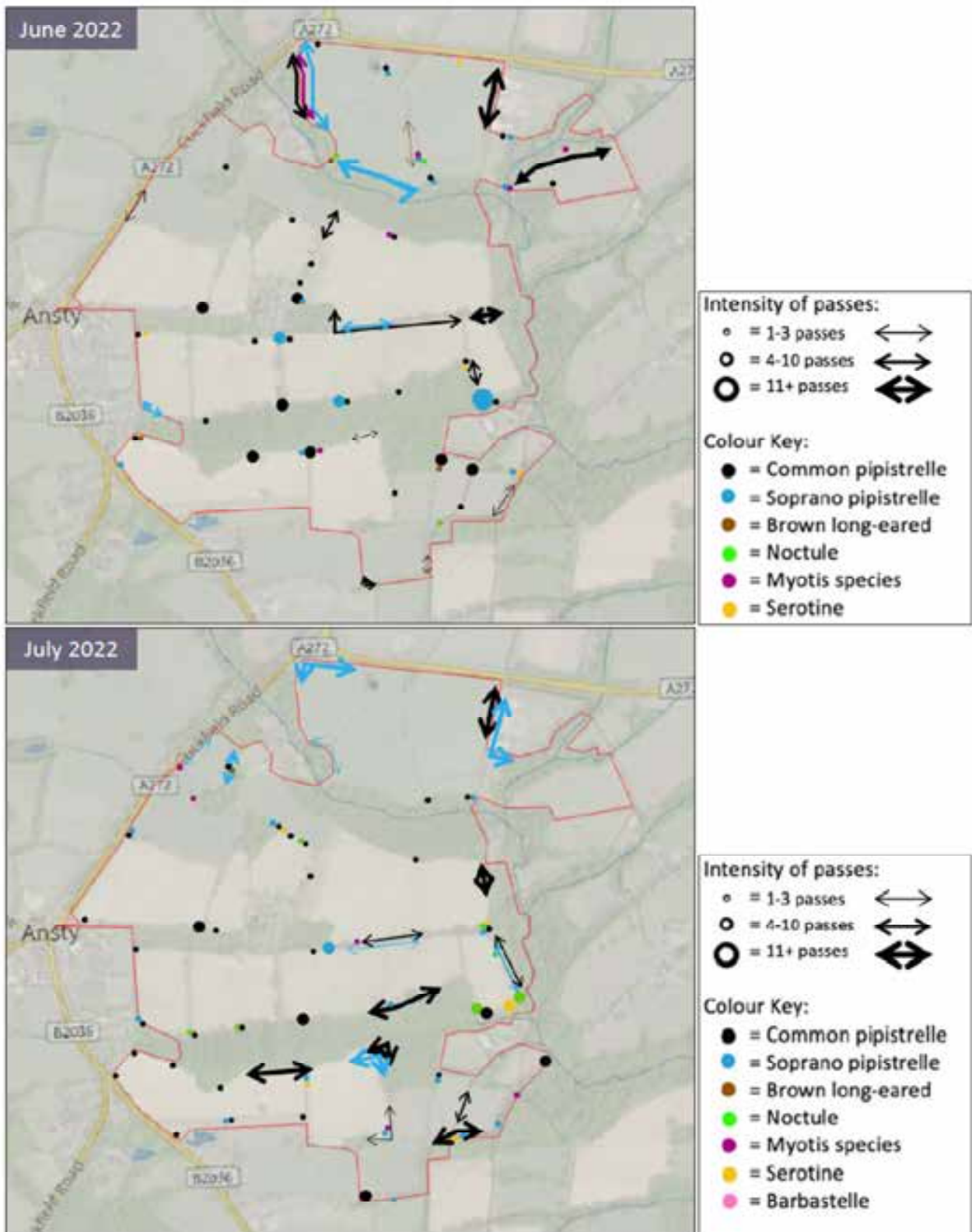


Figure 6. Approximate distribution of bats detected during each walked transect survey in June and July 2022. Images produced using QGIS.

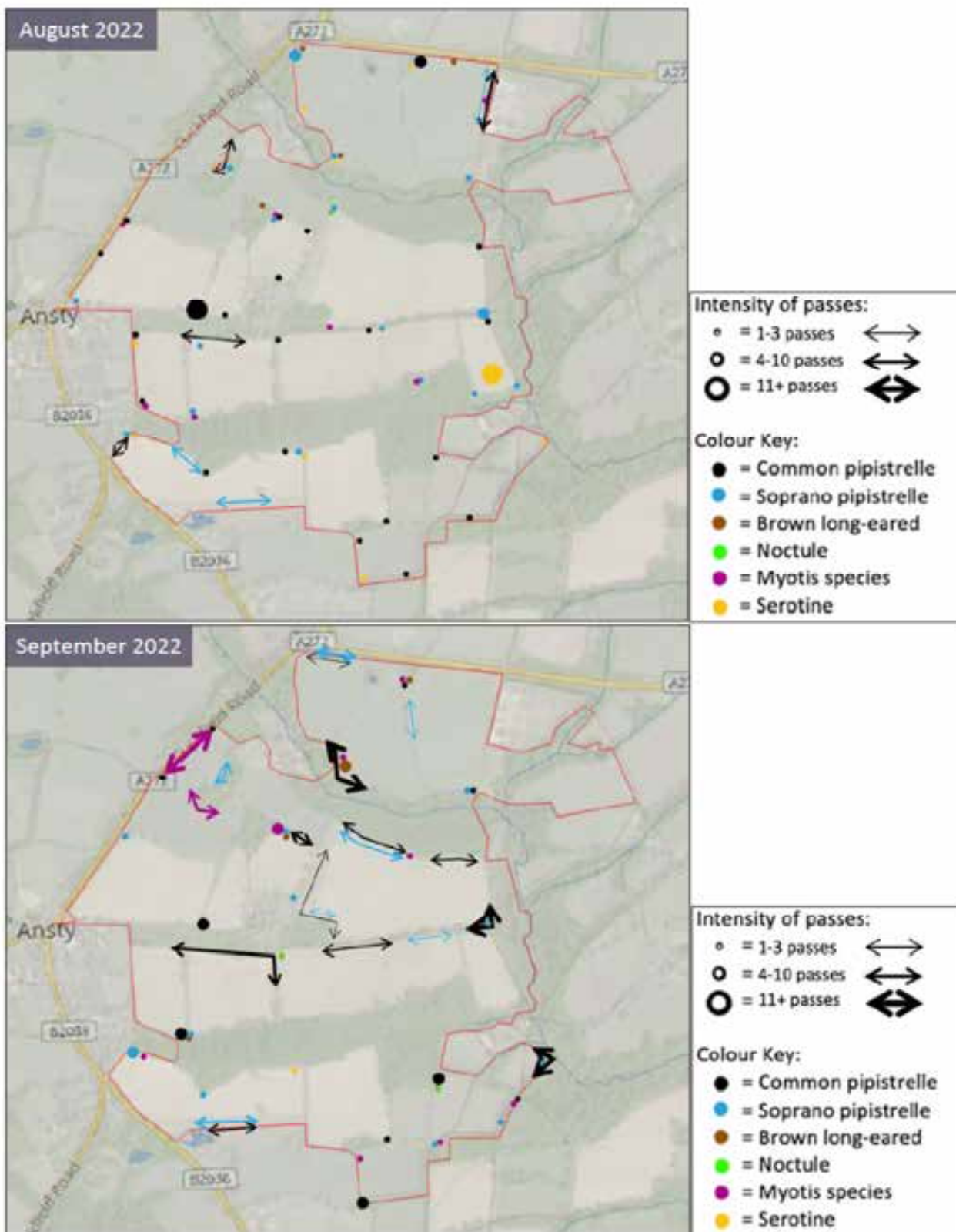


Figure 7. Approximate distribution of bats detected during each walked transect survey in August and September. Images produced using QGIS.

4.5 Bat Activity Surveys – Static Loggers

Table 8. The mean number of passes recorded by each static detector (rounded to nearest whole number) per night.

Logger	Date	Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Brown long- eared	<i>Myotis</i> sp.	Serotine	Noctule	Barb
1	13/04/22	33	42	-	1	2	-	-	-
	11/05/22	26	79	-	4	4	3	1	-
	15/06/22	237	151	-	1	8	5	1	-
	14/07/22	24	80	-	1	30	1	1	-
	12/08/22	28	93	-	9	41	3	1	-
	08/09/22	23	110	-	11	6	1	1	1
2	13/04/22	124	22	-	2	4	-	-	-
	11/05/22	Logger failed to record							
	15/06/22	15	41	1	5	2	1	1	-
	14/07/22	174	114	-	4	8	3	2	-
	12/08/22	428	86	-	7	8	2	3	1
	08/09/22	77	44	1	11	7	-	1	1
3	13/04/22	19	3	-	3	2	-	1	-
	11/05/22	25	12	-	1	2	1	1	-
	15/06/22	13	11	1	4	2	1	1	1
	14/07/22	29	8	-	7	10	5	1	-
	12/08/22	40	16	-	5	7	11	4	1
	08/09/22	18	10	1	4	15	1	1	-
4	13/04/22	14	8	-	2	2	-	-	-
	11/05/22	522	95	-	2	7	3	1	1
	15/06/22	719	22	-	3	9	2	2	-
	14/07/22	192	6	-	1	13	4	1	-
	12/08/22	92	32	-	8	13	19	4	-
	08/09/22	118	49	1	10	9	1	1	1
5	13/04/22	3	48	-	-	1	-	1	-
	11/05/22	94	41	-	1	4	1	0	1
	15/06/22	175	37	1	1	6	5	3	1
	14/07/22	229	59	-	1	16	16	6	1
	12/08/22	510	76	-	2	8	63	26	1
	08/09/22	24	47	1	1	6	1	1	1
6	13/04/22	11	20	-	1	1	-	-	-
	11/05/22	86	34	-	2	2	1	1	1
	15/06/22	156	23	1	1	5	2	1	-
	14/07/22	147	40	-	1	16	3	-	1
	12/08/22	60	45	-	3	33	6	4	-
	08/09/22	10	32	1	3	97	1	1	5

5 Breeding Birds

Table 9. Breeding bird transect metadata: dates, times, temperature, weather conditions.

Date	Survey start /end	Temp. degrees centigrade, weather conditions	Surveyors
24/03/22	07:20 - 08:30 Sunrise: 05:54	Max/Min temp.: 3 - 8°C BF0, CC 0%	Dan Bennett Ryan Walker Paul Stevens
12/04/22	06:40 - 08:11 Sunrise: 06:12	Max/Min temp.: 10 - 12°C BF1, CC 90%	Paul Whitby Ryan Walker Owen Crawshaw
03/05/22	06:20 - 07:50 Sunrise: 05:30	Max/Min temp.: 10 - 11°C BF0, CC 90%,	Paul Whitby Ryan Walker Dan Bennett
24/05/22	06:00 - 07:20 Sunrise: 04:59	Max/Min temp.: 10 - 10°C BF0, CC 20%	Dan Bennett Paul Whitby Owen Crawshaw
13/06/22	20:25 - 22:00 Sunset: 21:15	Max/Min temp.: 18 - 15°C BF1, CC 0%	Paul Whitby Dan Bennett Paul Stevens
30/06/22	05:20 - 06:50 Sunrise: 04:49	Max/Min temp.: 13 - 13°C BF0, CC 25%	Paul Whitby Dan Bennett Ryan Walker

Table 10. Breeding bird survey summary list. The table is divided into red, amber and green lists from the BoCC categories.

Species	24/03	12/04	03/05	24/05	13/05	30/06	Breeding status
Common starling <i>Sturnus vulgaris</i>	-	-	3	12	-	-	Possible
Herring gull <i>Larus argentatus</i>	-	3	-	-	4	-	Non-breeding
House sparrow <i>Passer domesticus</i>	-	2	4	1	-	5	Possible
Linnet <i>Linaria cannabina</i>	-	-	4	-	-	-	Un-likely
Marsh tit <i>Parus palustris</i>	1	-	-	-	-	-	Un-likely
Mistle thrush <i>Turdus viscivorus</i>	2	1	-	5	-	-	Possible
Skylark <i>Alauda arvensis</i>	3	2	1	-	-	1	Confirmed
Yellowhammer <i>Emberiza citrinella</i>	6	6	1	4	3	3	Confirmed
Bullfinch <i>Pyrrhula pyrrhula</i>	-	-	2	-	-	-	Possible
Dunnock <i>Prunella modularis</i>	3	5	8	8	2	7	Confirmed
Grey wagtail <i>Motacilla cinerea</i>	-	-	-	-	-	1	Un-likely
Moorhen <i>Gallinula chloropus</i>	1	-	-	1	-	1	Un-likely
Song thrush <i>Turdus philomelos</i>	9	8	8	12	17	9	Confirmed
Stock dove <i>Columba oenas</i>	2	41	7	4	-	8	Likely
Whitethroat <i>Sylvia communis</i>	-	-	-	2	-	3	Possible
Woodpigeon <i>Columba palumbus</i>	25	20	20	16	6	55	Confirmed
Wren <i>Troglodytes troglodytes</i>	20	19	27	25	5	20	Confirmed
Blackbird <i>Turdus merula</i>	13	26	23	22	19	25	Confirmed
Blackcap <i>Sylvia atricapilla</i>	-	7	11	7	2	8	Likely
Blue tit <i>Cyanistes caeruleus</i>	40	41	37	40	-	25	Confirmed
Buzzard <i>Buteo buteo</i>	2	1	2	-	2	1	Un-likely
Carrion crow <i>Corvus corone</i>	2	8	-	9	-	10	Possible
Chaffinch <i>Fringilla coelebs</i>	2	6	3	4	1	4	Likely
Chiffchaff <i>Phylloscopus collybita</i>	6	16	11	7	3	13	Likely
Coal tit <i>Periparus ater</i>	1	2	-	-	-	-	Un-likely
Firecrest <i>Regulus ignicapilla</i>	-	2	-	-	-	-	Un-likely
Garden warbler <i>Sylvia borin</i>	-	-	-	1	-	-	Un-likely
Goldcrest <i>Regulus regulus</i>	1	1	2	-	1	2	Possible
Goldfinch <i>Carduelis carduelis</i>	6	6	10	4	1	9	Likely
Great spotted woodpecker <i>Dendrocopos major</i>	3	7	3	7	2	6	Likely
Great tit <i>Parus major</i>	23	27	14	17	1	21	Confirmed
Green woodpecker <i>Picus viridis</i>	1	1	-	2	-	4	Possible



Figure 9. The location of notable birds species recorded during the survey in on 3rd May 2022 (left) and 24th May 2022 (right). Image produced in QGIS using BTO bird species codes.



Figure 10. The location of notable birds species recorded during the survey on 13th June 2022 (left) and 30th June 2022 (right). Image produced in QGIS using BTO bird species codes.

6 *Hazel Dormice*



Figure 11. Dormouse survey results. Red dots indicate nest tubes occupied by dormice on at least one occasion and yellow dots indicate that a dormouse nest was present. A peak of two dormice was found during a single survey. Image produced using QGIS.

7 Amphibians and Reptiles

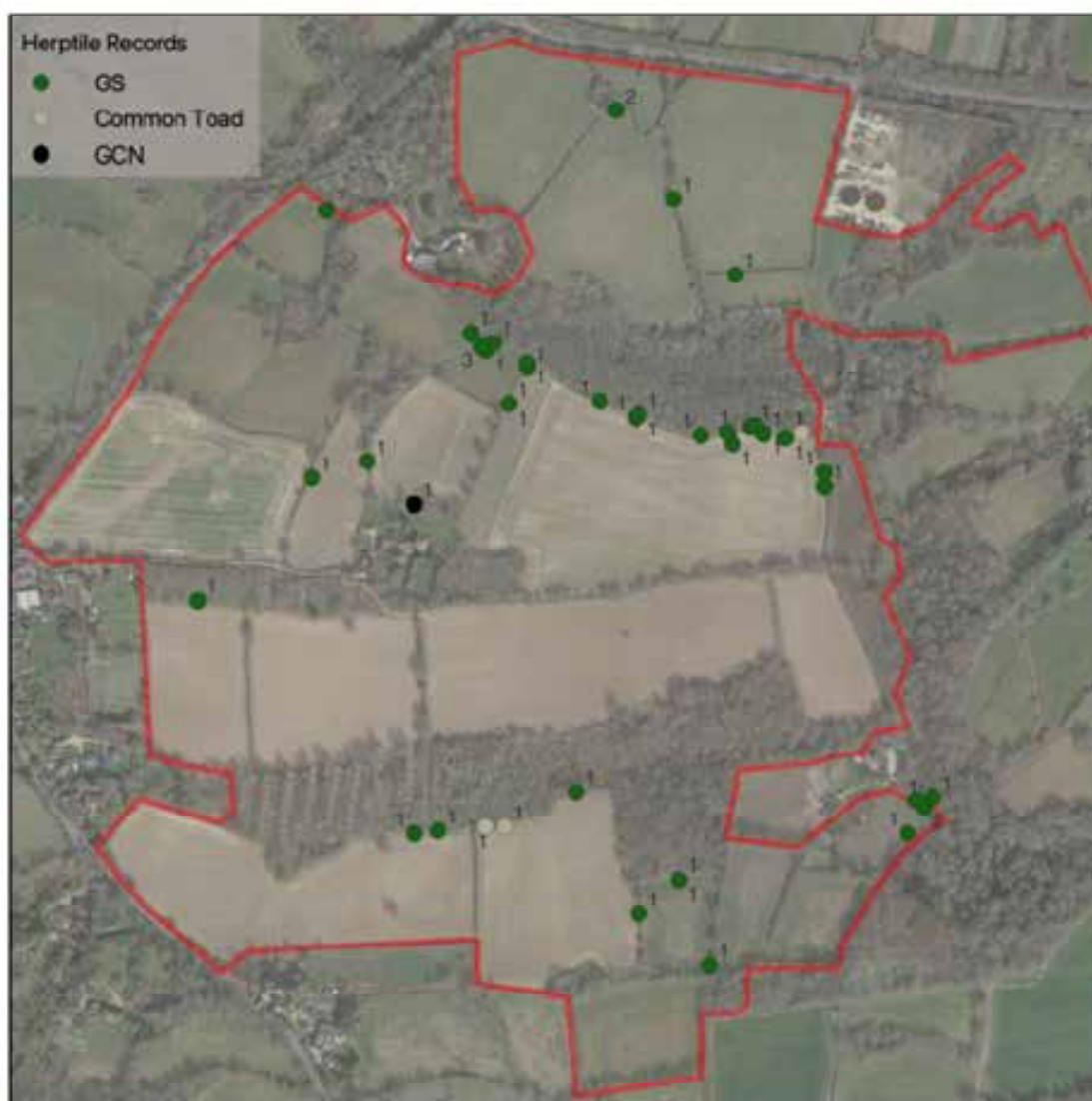


Figure 12. The location of reptiles (GS: grass snake) and amphibians (toad and great crested newt (GCN)) during the reptile surveys at Ansty in 2022.

Table 11. HSI results for the ponds within the site at Ansty. Please note that Pond 5 was dry and was therefore not assessed.

	Pond 1		Pond 3		Pond 4	
NGR	TQ 29914 23899		TQ 29582 23680		TQ 29640 23566	
SI attribute	SI value	Notes	SI value	Notes	SI value	Notes
Location	1.00	A	1.00	A	1.00	A
Pond area	0.6	300m ²	0.05	45m ²	0.4	200m ²
Pond drying	0.9	Never	0.5	Sometimes	1.0	Rarely
Water quality	0.33	Poor	0.67	Moderate	0.67	Moderate
Shade cover	0.6	80%	0.8	70%	1.0	60%
Water-fowl	0.67	Minor	0.67	Minor	0.67	Minor
Fish presence	0.7	Possible	1.0	Absent	1.0	Absent
No. ponds	1.0	>12	1.0	>12	1.0	>12
Terrestrial habitat	0.67	Moderate	1.0	Good	1.0	Good
Macrophytes	0.3	0%	0.3	0%	0.4	8%
HSI value	0.629	'Average'	0.55	'Below Average'	0.769	'Good'
eDNA result	NEGATIVE		NEGATIVE		NEGATIVE	
	Pond 6		Pond 7		Pond 8	
NGR	TQ 29714 23352		TQ 29642 23358		TQ 29638 23301	
SI attribute	SI value	Notes	SI value	Notes	SI value	Notes

Location	1.00	A	1.00	A	1.00	A
Pond area	0.05	40m ²	0.1	100m ²	0.05	20m ²
Pond drying	0.9	Never	0.9	Never	0.5	Sometimes
Water quality	0.67	Moderate	0.67	Moderate	0.67	Moderate
Shade cover	1.0	0%	1.0	5%	1.0	40%
Water-fowl	1.0	Absent	0.67	Minor	0.67	Minor
Fish presence	1.0	Absent	0.7	Possible	1.0	Absent
No. ponds	1.0	>12	1.0	>12	1.0	>12
Terrestrial habitat	0.67	Moderate	0.67	Moderate	0.67	Moderate
Macrophytes	0.45	15%	0.5	20%	0.5	20%
HSI value	0.63	'Average'	0.625	'Average'	0.57	'Below Average'
	Pond 9		Pond 13		Pond 20	
NGR	TQ 29657 23301		TQ 29861 22778		TQ 30076 22779	
SI attribute	SI value	Notes	SI value	Notes	SI value	Notes
Location	1.00	A	1.00	A	1.00	A
Pond area	0.05	6m ²	0.5	240m ²	0.1	100m ²
Pond drying	0.5	Sometimes	1.0	Rarely	0.9	Never
Water quality	0.67	Moderate	0.67	Moderate	0.67	Moderate
Shade cover	1.0	50%	0.6	80%	0.6	80%
Water-fowl	1.0	Absent	0.67	Minor	0.67	Minor
Fish presence	1.0	Absent	0.7	Possible	0.7	Possible
No. ponds	1.0	>12	1.0	>12	1.0	>12
Terrestrial habitat	0.67	Moderate	0.67	Moderate	1.0	Good
Macrophytes	0.5	20%	0.35	5%	0.3	0%
HSI value	0.596	'Below Average'	0.68	'Average'	0.587	'Below Average'
eDNA result			NEGATIVE		NEGATIVE	
	Pond 32					
NGR	TQ 30154 23499					
SI attribute	SI value	Notes				
Location	1.00	A				
Pond area	0.05	45m ²				
Pond drying	1.00	Rarely				
Water quality	0.67	Moderate				
Shade cover	0.6	80%				
Water-fowl	0.67	Minor				
Fish presence	1.0	Absent				
No. ponds	1.0	>12				
Terrestrial habitat	1.0	Good				
Macrophytes	0.3	0%				
HSI value	0.576	'Below Average'				
eDNA result	NEGATIVE					

Table 12. Results of great crested newt field surveys for Pond 6. Abbreviations: Tc=great crested newts; Lv=common newt *Lissotriton vulgaris*; Lh=palmate newt *Lissotriton helveticus*; Bb=common toad *Bufo bufo*; Rt=common frog *Rana temporaria*; M=male, F=female, Un=Unknown sex, ad=adult; j=juvenile, SA=sub adult. Turbidity/Veg cover: scale 0-5 where 0=clear, 5=completely turbid/obscured.

Torching results: Tc numbers					Bottle trapping results: Tc numbers				Pond 6 NGR: TQ 29714 23352	
Date	Turbidity	M	F	Un	No. traps:	M	F	Juv	Egg search	Other species/ observations (torching & trapping)
05/04/22	1	-	-	-	4 nets	-	-	-	Unable to reach vegetation	MLv: 8 MLh: 6 FUn: 23 JLv/Lh: 2 Bb tadpoles
19/04/22	2	1	2	-	4 nets	-	-	-	-	MLv: 7 FLv: 2 MLh: 2 FLh: 1 UnF not Tc: 7 J not Tc: 2
28/04/22	2	-	-	3	4 nets	1	-	-	Unable to reach vegetation	MLv: 6 FLv: 1 MLh: 3 FLh: 2 UnF not Tc: 5 Un not Tc: 7
10/05/22	2	-	-	3	4 nets	-	-	-	Unable to reach vegetation	MLv: 9 FLv: 1 MLh: 2 FLh: 1 F not Tc: 5 Un not Tc: 7
19/05/22	2	1	-	-	4 nets	1	-	3	Unable to reach vegetation	MLv: 11 FLv: 4 MLh: 1 FLh: 2 F not Tc: 8 J not Tc: 2
31/05/22	2	-	1	1	4 nets	-	1	-	Unable to reach vegetation	MLv: 1 FLv: 1 F not Tc: 8 Un not Tc: 5 SA not Tc: 1 FBb: 1

Table 13. Results of great crested newt field surveys for Pond 7. Abbreviations: Tc=great crested newts; Lv=common newt *Lissotriton vulgaris*; Lh=palmate newt *Lissotriton helveticus*; Bb=common toad *Bufo bufo*; Rt=common frog *Rana temporaria*; M=male, F=female, Un=Unknown sex, ad=adult; j=juvenile, SA=sub adult. Turbidity/Veg cover: scale 0-5 where 0=clear, 5=completely turbid/obscured.

Torching results: Tc numbers					Bottle trapping results: Tc numbers				Pond 7 NGR: TQ 29642 23358	
Date	Turbidity	M	F	Un	No. traps:	M	F	Juv	Egg search	Other species/ observations (torching & trapping)
05/04/22	5	-	-	-	15 btls	2	1		3 Tc	MLv: 1 Un not Tc: 12
19/04/22	4	1	1	-	14 btls	1	-	-	-	MLv: 5 FLv: 4 FLh: 1 F not Tc: 7 Un not Tc: 7
28/04/22	5	-	-	-	5 nets	1	-	-	-	MLv: 3 FLv: 7 FLh: 4 J not Tc: 1 Un not Tc: 3

10/05/22	4	-	-	1	5 nets	-	1	-	-	MLv: 5 FLv: 3 MLh: 1 FLh: 1 Un not Tc: 6
19/05/22	4	1	1	1	5 nets	2	1	-	-	MLv: 13 FLv: 6 MLh: 2 F not Tc: 6 Un not Tc: 12
31/05/22	4	-	-	1	5 nets	1	1	-	-	MLv: 4 FLv: 5 MLh: 4 FLh: 2 Un not Tc: 18

Table 14. Results of great crested newt field surveys for **Pond 8**. Abbreviations: Tc=great crested newts; Lv=common newt *Lissotriton vulgaris*; Lh=palmate newt *Lissotriton helveticus*; Bb=common toad *Bufo bufo*; Rt=common frog *Rana temporaria*; M=male, F=female, Un=Unknown sex, ad=adult; j=juvenile, SA=sub adult. Turbidity/Veg cover: scale 0-5 where 0=clear, 5=completely turbid/obscured.

	Torching results: Tc numbers				Bottle trapping results: N/A – too shallow for traps				Pond 8 NGR: TQ 29638 23301	
Date	Turbi- dity	M	F	Juv	No. traps:	M	F	Juv	Egg search	Other species/ observations (torching & trapping)
05/04/22	3	-	-	-	-	-	-	-	-	Un not Tc: 2
19/04/22	Pond dry. No further surveys.									
28/04/22										
10/05/22										
19/05/22										
31/05/22										

Table 15. Results of great crested newt field surveys for **Pond 9**. Abbreviations: Tc=great crested newts; Lv=common newt *Lissotriton vulgaris*; Lh=palmate newt *Lissotriton helveticus*; Bb=common toad *Bufo bufo*; Rt=common frog *Rana temporaria*; M=male, F=female, Un=Unknown sex, ad=adult; j=juvenile, SA=sub adult. Turbidity/Veg cover: scale 0-5 where 0=clear, 5=completely turbid/obscured.

where 0 = clear, 1 = completely turbid/obscured.

	Torching results: Tc numbers				Bottle trapping results: Tc numbers				Pond 9 NGR: TQ 29657 23301	
Date	Turbi- dity	M	F	Juv	No. traps:	M	F	Juv	Egg search	Other species/ observations (torching & trapping)
05/04/22	1	-	-	-	4 btls	-	-	-	-	Un tadpoles
19/04/22	1	-	-	-	Too shallow for trapping				-	-
28/04/22	Pond dry. No further surveys.									
10/05/22										
19/05/22										
31/05/22										

Table 16. Reptile survey results for Ansty. (Please note that the site was split into two and surveyed by two surveyors at a time to ensure the survey could be completed before weather conditions became unsuitable e.g. too hot. The surveyors usually carried out the survey at the same time but occasionally this was not possible, hence why some of the survey visits are split in the table. New sheets were set out following the 4th survey due to a number of sheets being destroyed. This date is included in the table as there was an incidental record for a grass snake but this was not an official survey.)

Survey Visit Number	Date	Time		Weather Notes - wind speed (BF), cloud cover (cc%), sunny/misty, recent rainfall etc.	Temperature (°C)		Reptiles Found			Refuge location (what three words)
		Start	End		Air	Refugia	Species GS: Grass Snake, Bb: Common toad, GCN: Great crested newt	Age & Sex M- male, F - Female, A - Adult, Juv - Juvenile	Number of Individuals	
1	06/05/22	08:30 - 09:30	10:30 - 12:00	BF1, cloud cover 20%, Sunny	12 - 15	22	GS	Juv	1	gaps closer lobby
							GS	Juv	1	event fester fins
							GS	FA	1	cost dips force
							GS	MA	1	chew shirt dreams
2	27/05/22	08:30 - 09:00	11:00 - 11:30	Sunny, CC 25%, BF0	14 - 18	28-34	GS	Juv	1	season vent acute
							GS x2	Juv	2	mini pardon slimy
							GS	FA	1	fields dirt accent
							GS	FA	1	serve locked vibrates
							GS	MA	1	teeth slap gown
							GS	MA	1	oufit soils hurray
							GS	MA	1	rivers souk treat
							GS	FA	1	snow casino belong
3	10/06/22	08:00	13:00	sunny, 25% CC, BF0	13 - 18	18 - 34	GS	FA	1	oufit soils hurray
							GS	FA	1	audit grew values
							GS	Juv	1	cook rated spun
							GS	FA	1	nures reason invest
							GS	Juv	1	gaps closer lobby
							GS	MA	1	vital exchanges entertainer
4 (South)	28/06/22	08:15	10:30	Sunny, 15% CC, BF0	13 - 17	17 - 29	GS	FA	1	cost dips force
							GS	FA	1	snow casino belong
4 (North)	05/07/22	08:00	10:30	15, 0% cc, BF1	15 - 18	20 - 31	GS	Juv	1	news sunk such
							GS	MA	2	flank editor trick
							GS	MA	1	anyway cases loud
							GS	A	1	mutual matheer salt
Replacing lost sheets	17/08/22	N/A	N/A	N/A	N/A	N/A	GS	FA	1	taxi angel stream
5	28/08/22	08:00 - 08:30	10:30	Sunny 50%CC, BF0 (fog cleared 30mins before arrival)	14 - 18	17-34	GS	Juv	1	skill risky legs
							GS	MA	1	jump limit loses
							GS	FA	1	stick nail feared
							GS	Juv	1	firmly dunes form
							GS	MA	1	exams topped trash

Survey Visit Number	Date	Time		Weather Notes - wind speed (BF), cloud cover (cc%), sunny/misty, recent rainfall etc.	Temperature (°C)		Reptiles Found			Refuge location (what three words)
		Start	End		Air	Refugia	Species GS: Grass Snake, Bb: Common toad, GCN: Great crested newt	Age & Sex M- male, F - Female, A - Adult, Juv - Juvenile	Number of Individuals	
				sunny intervals			Bb	A	1	dream rats ships
							GS	MA	1	cost intervals like
							GS	FA	1	organ flames beyond
							GS	A	1	varieties gown round
							GS	1F, 2M	3	teeth bronze jumped
							GCN	FA	1	towns petty desk
							GS Skin	-	1	spark bless drill
6	15/09/22	15:20 - 15:00	17:25 - 17:00	BF3, sunny 30% cc	17 - 16	29 - 27	GS	Juv	1	patio tame deed
							GS	Juv	1	minds torch chemistry
							GS	AM	1	flip wooden spoon
							GS	AM	1	spoken cook rice
							GS	AM	1	then swing silly
							GS	AF	1	spice tinsel rash
							GS	AM	1	sums both brand
							GS	AM	1	shadow drama names
							GS	AF	1	toxic pile pouch
							Bb	A	1	firmy dunes form
7 (south)	28/09/22	16:06	18:25	BF3, intervals 60% - 15% cc, sunny	14 - 12	23 - 14	Bb	A	1	decay basis email
7 (north)	28/09/22	09:00	11:00	BF1, cloud cover 20%, Sunny	12 - 15	25	GS	Juv	1	sulk path trials
							GS	F	1	spice tinsel rash

8 Aquatic Invertebrates

Samples taken on 18th May 2023

Sample Point 1: TQ 3008 2357 Copyhold Stream, upstream footpath crossing and confluence with headwater carrying sewage works effluent.

Sample point 2: TQ 3025 2337 Copyhold Stream, Furnace Wood, downstream footpath crossing and confluence with headwater carrying sewage works effluent.

Sample point 3: TQ 3013 2308 Headwater stream flowing through Ridden's Wood.

Latin name	English name/type	Sample 1 u/s STW Copyhold Stream	Sample 2 d/ STW Copyhold Stream	Sample 3 Small tributary
ELMIDAE Riffle beetles				
<i>Elmus aenea</i>		2	1	
<i>Limnius volkmari</i>		2	1	
HELOPHORIDAE Groovy mud beetles				
<i>Helophorus brevipalpis</i>				1
SERICOSTOMATIDAE Cased caddisflies BMWP 10-scorer				
<i>Sericostoma personatum</i>		3	2	
LIMNEPHILIDAE Cased caddisflies BMWP 7-scorer				
<i>Chaetopteryx villosa</i>				2
LEPTOCERIDAE Cased caddisflies BMWP 10-scorer				
<i>Athripsodes</i> sp.		2		
GOERIDAE Cased caddisflies BMWP 10-scorer				
Unidentified pupa in case		1		
HYDROPSYCHIDAE Caseless caddisflies BMWP 5-scorer				
<i>Hydropsyche saltalai</i>		2	2	
POLYCENTROPODIDAE Caseless caddisflies BMWP 7-scorer				
<i>Polycentropodus flaveomaculatus</i>		1	1	
<i>Holocentropus dubius</i>			1	2
OSMYLIDAE Giant lacewing				
<i>Osmylus fulvicephalus</i>		1		
VELIDAE Water crickets				
<i>Velia caprai</i>				1
CALEOPTERYGIDAE Demoiselles BMWP 8-scorer				
<i>Caleopteryx virgo</i> Beautiful demoiselle		2		
BAETIDAE Mayflies BMWP 4-scorer				
<i>Baetis rhodani</i>		3	2	
LEPTOPHLEBIDAE Mayflies BMWP 10-scorer				

Latin name	English name/type	Sample 1 u/s STW Copyhold Stream	Sample 2 d/ STW Copyhold Stream	Sample 3 Small tributary
<i>Habrophlebia fusca</i>		3	3	1
EPHEMERELLIDAE Mayflies BMWP 10-scorer				
<i>Ephemerella ignita</i>		2	3	
EPHEMERIDAE Mayflies BMWP 10-scorer				
<i>Ephemera danica</i>		3	3	2
HEPTAGENIIDAE BMWP 10-scorer				
<i>Ecdyonurus torrentis</i>		1	1	
<i>Rhithogena semicolorata</i>		2	2	
SIMULIIDAE Blackflies BMWP 5-scorer				
<i>Simulium</i> sp.		2	2	
CHIRONOMIDAE Non-biting midge BMWP 2-scorer				
CHIRONOMINAE spp.		2	2	
TANIPODINAE spp.		1	1	
ORTHOCLADINAE spp.				
<i>Prodiamesa olivacea</i>		1	1	
<i>Thienemonniella</i> spp.				1
CERATOPOGONIDAE spp.		2	1	
GAMMARIDAE BMWP 6-scorer				
<i>Gammarus pulex</i> Freshwater shrimp		3	4	3
ASELLIDAE BMWP 3-scorer				
<i>Asellus aquaticus</i> Common water hog-louse			2	
SPHAERIDAE BMWP 3-scorer				
<i>Pisidium</i> sp. Pea mussel		2	2	
PISCICOLIDAE BMWP 4-scorer				
<i>Piscicola geometra</i> Fish leech		2	2	
GLOSSIPHONIDAE BMWP 3-scorer				
<i>Glossiphonia heteroclita</i>		1		
ERPOBDELLIDAE BMWP 3-scorer				
<i>Erpobdella testacea</i>		2		
OLIGOCHAETA Segmented worms spp. BMWP 1-scorer				
NEMATOMORPHA Horsehair worms sp.				1



Ecological Impact Assessment

Ansty, Haywards Heath

Appendix 3 – Photographs



Photograph 1. A view across the south-west field at the site. Note the hedgerow to the left, mature tree in the field and the woodland to the right.



Photograph 2. A view of the rye field at the centre of the site, before and after it's been harvested.



Photograph 3. An example of the arable margins across the site and their varying botanical diversity.



Photograph 4. A view of the grassland within the south-east corner of the site.



Photograph 5. A view inside the ancient woodland within the southern half of the site (left) and north-east of the site (right). Note the dense carpet of bluebells (left) and yellow archangel (right).



Photograph 6. An example of the dense moss, liverworts and ferns within the ghyll woodland at the site.

Appendix G2: Bat Trapping and Radiotracking Report

Greater Ansty New Village

Bat Trapping and Radiotracking Report

Report for Fairfax Properties

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Summary of Key Findings

Temple was commissioned by Fairfax Properties in February 2022 to provide specialist bat consultancy services to identify species assemblage, roosts and flightlines for bats that may be adversely affected by the proposed development at Greater Ansty New Village, Haywards Heath.

The development proposal includes the construction of a new settlement at Ansty to include approximately 1600 new homes, community hall and playing fields, primary school, and a relief road opening up access to the site, and removing through-traffic from the village.

Surveys undertaken on site included trapping of bats within the development boundary. Subsequent radio-tracking of tagged bats was undertaken up to 2km from the site boundary to determine roost locations and flightlines. These surveys were undertaken to provide baseline information on bats within and adjacent to the site, that can be used to inform the mitigation design of the proposed development.

The surveys included three bat trapping sessions undertaken over nine nights on 6th-8th June, 1st-3rd August and 22nd-24th September 2022. Trapping of bats was undertaken at six locations within and adjacent to the site boundary, with a minimum of two traps placed at each location.

A total of 67 bats from ten species were captured. The species included barbastelle *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, Alcathe bat *Myotis alcathoe*, Brandt's bat *Myotis brandtii*, brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri*, soprano pipistrelle *Pipistrellus pygmaeus*, and whiskered bat *Myotis mystacinus*. All species of bat are included under Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). Breeding females from four species Alcathe bat, brown long-eared bat, common pipistrelle and whiskered bat were trapped during surveys. Radio-transmitters were fitted to three Bechstein's bats and one barbastelle. Subsequent radio-tracking surveys identified roost locations and flightlines

from the roost for these bats where possible. During the surveys, six roosting locations were identified, all between 300m east and 1.2km north-east.

The site is used by a wide assemblage of bats and the trapping and radio-tracking surveys have confirmed the importance of the site at a regional level for the rare Bechstein's bats, barbastelle and Alcahloe bats. Although roosts were not discovered within site, the presence of these species, including breeding Alcahloe increases the significance of the site for bats. The site provides high value roosting, foraging and commuting opportunities for bats in the form of mature hedgerows and trees, ancient woodland and riparian habitat. The proposed development therefore has the potential to impact the favourable conservation status of bats on site should these habitats be impacted.

The results of these surveys, along with those undertaken by The Ecology Co-Op (2023) should be used to inform any necessary mitigation and compensation for the proposed development.

1 Introduction

BACKGROUND TO COMMISSION

- 1.1 Temple was commissioned by Fairfax Properties in February 2022 to undertake specialist bat consultancy services to identify species assemblage, roosts and flightlines for bats that may be impacted the proposed development at Greater Ansty New Village, Haywards Heath.
- 1.2 The surveys were undertaken to form part of the baseline bat surveys on site, alongside surveys undertaken by The Ecology Co-Op. The results of the surveys will be used to inform design proposals.
- 1.3 The trapping survey covered the areas within the redline boundary (henceforth referred to as 'the site') as indicated on the plan provided by the client (shown in red in Appendix 1, Figure 1), and up to 2km from the boundary for radio-tracking surveys. The radio-tracking surveys aimed to determine roost locations of tagged bats. A 2km search area for this survey type was considered proportionate to the potential impacts of the proposals.

PROJECT AIMS

- 1.4 The aims of the project are to:
 - investigate the species assemblage within the site; and
 - collect data on roosting locations, roost type, and flightlines from the roost for Alcatheae *Myotis alcathoe*, barbastelle *Barbastella barbastellus*, and Bechstein's bat *Myotis bechsteinii* located up to 2km from the site boundary.
- 1.5 The above species were chosen due to their rarity, legislative protection and / or known susceptibility to impacts from development. All three species are considered very rare or data deficient within both the UK and Sussex (BCT, 2010 and Sussex Bat Group, 2019). Bechstein's bat (and some other species not recorded in the current survey) receive a higher level of legislative protection than other bat listed on Schedule 2, Conservation of Habitats and Species Regulations 2017 (as amended).

- 1.6 The survey proposes to radio-tag up to a maximum of two Alcathoe, eight barbastelle, and eight Bechstein's bat per survey session. However, overall numbers will be limited to 10 bats per survey session. The proposal for tagging up to 30 individuals over the 2022 survey season of the aforementioned species is due to the presence of highly suitable habitats for these species, the possible impacts upon these habitats, and the numbers of bats required to get adequate data to determine impacts.

SITE CONTEXT AND STATUS

- 1.7 The site at Ansty Farm is located to the south of the village of Cuckfield and the north-east of the village of Ansty, West Sussex.
- 1.8 The site is approximately 197ha in size, of which 98ha would be utilised for the proposed development, and the remaining 99ha for a Country Park (as shown in Appendix 1). This application relates only to the proposed development site.
- 1.9 The site comprises hedgerow and tree lined arable and pasture fields, along with areas of Deciduous Woodland, a Habitat of Principal Importance, including at least 7.3ha Ancient and Semi-Natural Woodland (ASNW). A watercourse runs through the site.

DEVELOPMENT PROPOSALS

- 1.10 The development proposal includes the construction of a new settlement at Ansty to include:
- approximately 1600 new homes;
 - a new community hall and playing fields;
 - a new primary school;
 - a network of informal open spaces and new footpaths;
 - screening planting along contours to soften the views into the scheme;
 - a new relief road opening up access to the site, and removing through-traffic from the village;

- new paths and trails along existing hedgerows; and
- a masterplan design which features a network of linear green routes permeating the scheme on the alignment of the streams, hedgerows, tree belts and woodland groups.

RELEVANT LEGISLATION AND PLANNING POLICY

1.11 The following key pieces of nature conservation legislation are relevant to this assessment. A more detailed description of this legislation is provided in Appendix 3.

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- Natural Environment and Rural Communities Act 2006; and
- The Environment Act 2021.

1.12 The National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2021) and The Environment Act 2021 requires local authorities to avoid and minimise impacts on biodiversity and to provide net gains in biodiversity when taking planning decisions. In addition, in England, under Section 40 of the Natural Environment and Rural Communities Act 2006, all public bodies are required to have regard to biodiversity conservation when carrying out their functions.

2 Methodology

- 2.1 The methods used generally followed the standard best practice guidance for trapping and radio-tracking (Collins, 2016). Any specific deviations due to objectives of the surveys are highlighted where necessary.
- 2.2 The sites for trapping were selected on the basis of a site walkover led by Rosie McLaughlin BSc (Hons) MSc (Natural England level 4 bat licence holder) and obtaining records of Annex II species from Sussex Bat Group (Sussex Bat Group, pers comm.), and, using analysis of aerial photography and Ordnance Survey (OS) map data to assess the landscape and habitat connectivity. Sites were chosen to maximise coverage of the habitats of high suitability for bats within the site boundary.
- 2.3 Initial trapping surveys focussed on six points located within the site boundary. These trapping locations were subject to a ground truthing assessment prior to each session to ensure the habitat remained suitable for trapping surveys, with slight deviations made if required, for example for health and safety reasons. The extent of the site boundary and proposed trapping locations can be found in Figures 1 and 2 respectively in Appendix 1.
- 2.4 Roosts for target species were then identified through radio-tracking surveys where possible.

DESK STUDY

- 2.5 A desk study was obtained from Sussex Biodiversity Records Centre to acquire data relating to bats within a 2km radius of the site, and up to 15km for any internationally designated sites with bats included in their designations. Additional contextual information was compiled from publicly available data sources:
- MAGIC (<http://www.magic.gov.uk>) – the Government's on-line mapping service. Information was sought regarding: the presence of ASNW, statutory

designated nature conservation sites and extant or historic mitigation licences for bats; and

- Ordnance Survey mapping and publicly available aerial photography to determine any features such as: running and standing water, woodland, tree lines, hedgerows, railway corridors and the surrounding landscape uses.

TRAPPING SURVEYS

2.11 The bat trapping and radio-tracking survey work targeted three bat species that form part of the bat assemblage, as per the aims listed in Section 1:

- Alcathe bat;
- Barbastelle; and
- Bechstein's bat.

2.12 These species were selected with reference to their rarity, legislative protection and / or known susceptibility to impacts from development.

2.13 All bats were caught, handled and radio-tracked under Natural England project licence 2022-61182-SCI-SCI and 2022-61182-SCI-SCI-1.

2.14 Trapping surveys were carried out for a total of nine nights over three sessions (three nights per session) on:

- 6th to 8th June 2022 (pre-maternity);
- 1st to 3rd August 2022 (post-maternity); and
- 22nd to 24th September 2022 (autumnal dispersal).

2.15 Trapping locations are provided in Table 2.1 below and Appendix 1, Figure 2.

Table 2.1: Trapping locations

Trapping location	Easting	Northing	Description
1a	529462	123239	Field edge adjacent to treeline and hedge
1b	529436	123029	Within woodland
1c	529613	123053	Within woodland
2a	530087	123084	In centre of Ridden's Wood, under oak
2b	530150	123114	On edge of Ridden's Wood, under oak
2c	530256	123154	On edge of Furnace Wood
3a	530206	123287	Under oak tree on edge of hazel coppice
3b	530222	123361	On woodland track within hazel coppice
3c	530249	123362	Under beech adjacent to stream
4a	529618	123579	On edge of small, wet oak/alder woodland, under immature ash
4b	529796	123573	On edge of woodland, between deadwood and oak
4c	530010	123574	Within wet oak/alder woodland
4d	529905	123608	Within wet oak/alder woodland
4e	529824	123636	Within wet oak/alder woodland
5a	530219	123680	Woodland edge
5b	530213	123608	Woodland edge, stream
5c	530276	123640	Woodland edge
5d	530102	123584	Woodland, stream
6a	530332	122959	Within woodland
6b	530264	122836	Within woodland
6c	530376	122841	Within woodland

2.16 Trapping surveys were carried out using Faunatech Austbat Harp Traps. A harp trap consists of a bank of vertical fine nylon filaments tightly strung to a rectangular frame of aluminium pole further supported by aluminium pole legs. The trap safely catches bats in flight by taking away their momentum. The bats then safely fall into a large cotton bag affixed below the trap where they can be removed by hand. A combination of two-bank and three-bank harp traps were used for the trapping surveys.

- 2.11 In addition to harp traps, a single mist net was also deployed on 22nd September 2022 at Location 1c. Mist netting was carried out using Ecotone ultra-thin Series M Mist nets mounted on telescopic poles. Mist nets consist of a nylon monofilament, available in a variety of lengths stretched between two poles. Each net is 2.4m in height and comes in 6, 9 and 12m lengths with four shelves which are tensioned lines that allow the trap to safely catch bats in flight by taking away their momentum. The bats then become trapped between folds of the net where they can then be removed by hand.
- 2.12 The locations of traps were selected to maximise capture of bats, based on the presence of habitat features commonly used by commuting and / or foraging bats including woodland habitat, hedgerows and watercourses.
- 2.13 Each trap was fitted with a Sussex Autobat acoustic lure to increase the likelihood of catching bats. The acoustic lure simulates a variety of bat social calls. Simulations of barbastelle, Bechstein's bat, small Myotis bats (whiskered bat, Alcathe bat, and Brandt's bat) and Nathusius' pipistrelle were used during the surveys.
- 2.14 The bats captured in the traps were removed by a suitably experienced ecologist, under the direction of the licensed ecologist or accredited agent, and each bat was transferred to an individual clean cloth bag. The bats were identified to species wherever possible (see DNA analysis below), and sexed, with reproductive status ascertained. If required for identification, or if the bat was selected for radio-tagging, it was also weighed using a Pesola light line spring scale or Ascher portable digital scale, forearm measured using callipers, and any other general health observations were noted.
- 2.15 Bats selected for radio-tagging were retained, so as to have a radio-transmitter attached and ring fitted and were released at the site of capture after processing. All other bats were safely released immediately, in close proximity to the site of capture.

2.16 Female bats (specifically reproductive females) were selected for radio-tagging in preference to male bats, as tracking breeding females enables the increased likelihood of identification of maternity roosts which are of higher conservation significance than other roost types used by bats in the active season. Bats were selected so that the radio-tag comprised no more than 5% of the total weight of the bat. Bats which were in the advanced stages of pregnancy were not selected for radio-tracking for welfare reasons of the unborn young.

DNA ANALYSIS

2.17 DNA analysis was undertaken conducted through the non-invasive method of dropping analysis. This technique was used for small Myotis bats (whiskered bat, Alcaethoe bat, and Brandt's bat) when there was uncertainty regarding species identification in the hand.

2.18 Bat droppings were collected from the clean cloth bags in which the bats were held, using gloves to avoid contamination of the sample. Droppings were then transferred into a clean, dry and sterile Eppendorf-type plastic tube. When possible, up to five droppings from an individual were added to a sample tube, to allow for a retest if required. The samples were labelled, noting likely species, sex, biometrics, health status and trapping location of each animal. Samples were then sent to University of Warwick for analysis to confirm bat species. In certain scenarios, it is not always possible to retrieve a faecal sample from a bat, due to the short duration of capture. Therefore, these bats are identified to genus level.

RADIO-TRACKING SURVEYS

2.19 Fur was clipped from the area between the shoulder blades of bats selected for radio-tagging. Transmitters (Holohill radio-tags) were attached to each bat in this area using an adhesive (Skin-Bond® Pfizer Inc). Each radio-tagged bat was assigned a unique identification number associated with the radio frequency of the transmitter attached to it. This frequency was programmed into the radio receiver carried by the radio-tracking team. Any bats selected for radio-tagging were also ringed using 2.9 millimetre (mm) rings obtained from the Bat Conservation Trust.

The use of rings allowed the project team to avoid tagging any bat twice in one season, should it be recaptured.

2.20 Bats fitted with radio-transmitters were released on the same night of capture in close proximity to the capture site. A day-time roost search team located the tagged bats using a Biotrack® 'Sika' radio receiver, which in turn enabled an emergence survey to be undertaken to ascertain the colony size and type and, also (see Bat Emergence Surveys below) to identify the features used by the radio-tagged bats as flight lines to commute between roosting locations and foraging habitat.

2.21 Each bat fitted with a radio-tag was tracked for up to five consecutive days.

BAT EMERGENCE SURVEYS

2.22 From a total of six confirmed roosting locations identified by this study, emergence surveys were undertaken at four bat roost locations. Not all roosting locations were subject to emergence surveys due to constraints detailed in the Data Validity and Limitations section below.

2.23 The emergence surveys aimed to locate the roost access / egress points where possible and to determine the number of bats using the roost and characterise the roost type. Surveys were undertaken by experienced bat surveyors in appropriate weather conditions following standard guidelines on emergence survey procedure (Collins, 2016).

2.24 Observations were made from the outside of the tree identified as a roost. Dusk emergence surveys commenced approximately 15 minutes before sunset and lasted for approximately 90 minutes after sunset with reference to best practice methods (Colins, 2016) to confirm use of a bat roost, or 30 minutes after the last bat emergence was recorded.

2.25 Real time detectors (Elekon Batlogger M) were used to record bat echolocation calls of any emerging bats and to identify species where possible.

- 2.26 Canon XA10 / XA20 / XA30 Camcorders with IR lamps (COP LIR-IC88 IR LED Flood Lamp) or with thermal equipment (FLIR T1020 with 45 degree lens) were used in conjunction with surveyor's observations during the bat emergence surveys to ensure appropriate coverage of all elevations and to ensure that accurate individual counts were obtained. The recordings were later examined using VLC media player (version 2.2.6 Umbrella) to confirm the number of bats (if any) that emerged from the videoed location.
- 2.27 All bat emergences were noted, and bats were identified to species where possible. Echolocation calls were recorded onto the in-built sound card of the detector (Elekon Batlogger M). These were subsequently analysed using Elekon BatExplorer or Wildlife Acoustics Kaleidoscope Pro computer software, which facilitates species identification, by an ecologist with experience of call analysis.
- 2.28 If the bat was recorded within or close to the site boundary, estimates of flightlines were obtained following emergence from the roost to determine which features the bats were using to commute. This was obtained by radio-tracking the bat upon emergence, taking multiple bearings based on the signal from the receiver to determine the likely commuting route. Flightlines from the roost were not obtained for bats roosting outside the site boundary due to lack of proposed impacts to these areas.

DATA VALIDITY AND LIMITATIONS

- 2.29 Both two-bank and three-bank harp traps were used during the trapping sessions. Although there is anecdotal evidence that the three-bank is a more efficient harp trap, there is no scientific evidence base to support this. Therefore, the interchanging use of both trap types poses no limitation to the survey.
- 2.30 Biometric data was not collected for every bat caught due to IUCN guidelines on bat handling during the Covid-19 pandemic (IUCN SSC Bat Specialist Group (BSG), 2021). This was not considered to be a significant constraint to surveys as the data required to determine the species and breeding status of bats was always obtained, with the exception of a small number of small Myotis bats (see next paragraph).

- 2.31 As the duration of capture was short and Covid-19 restrictions limited handling of bats, it was not always practicable to collect a DNA sample from each bat. DNA analysis was therefore not feasible in two cases for whiskered/Alcathoe bats (Bats 49 and 50). Where identification to species level was not possible with Bats 49 and 50, these two individuals were identified to species group e.g. small Myotis.
- 2.32 Bat activity surveys by The Ecology Co-Op (2023) provided records for barbastelles. As such, the August and September trapping sessions at trapping location 2 were moved to the areas closest to the highest barbastelle activity. In addition, trapping location 2 were changed due to health and safety concerns. This is not considered to be a significant constraint to surveys.
- 2.33 The positions of the radio-tagged bats were received at intervals after leaving the roost when considered necessary (see paragraph 2.28) and this information was used to identify flightlines between the roost and foraging areas. Therefore, flightlines were partially estimated based on the best available data. The implications of partially estimating flight lines and foraging areas on the best available data may result in missing areas that are not identified as core foraging area or flightlines. This is an acceptable limitation as assumptions on direction and use of landscape features can be made based on known bat behavioural ecology.
- 2.34 Due to the rarity of Alcathoe bat, this species would have been selected for tagging. However, all individuals captured were too small for the radio-tags available. Data for this species is therefore limited.
- 2.35 Some emergence surveys undertaken during the radio-tracking study could not identify the exact location of the roosting feature due to the cluttered nature of the woodland and / or the roost feature being obscured by branches from ground level (Roost R1 and R5). Access was not possible for all emergence surveys due to landowner restrictions and health and safety concerns (Roost R3 and R6). In these cases, an accurate roost count could not be obtained and, therefore, the roost could not be characterised. This is not considered to be a significant constraint to surveys

as all roosts identified were located outside the site boundary and therefore not subject to impacts of the proposed development.

3 Results

DESK STUDY

Designated sites

- 3.1 No internationally designated sites with bats listed on the designation are located within 15km of the site.
- 3.2 Two statutory designated sites are located within 2km of the site. These are Ashenground and Bolnore Woods Local Nature Reserve (LNR) located approximately 1.4km east-south-east, and Blunts and Paiges Wood LNR located approximately 1.25km to the north-west.
- 3.3 Two areas of ASNW, Hangar Wood and Freizeland Wood, were present on site. Furthermore, there were several areas of Lowland Mixed Deciduous Woodland and Open Water, both listed as Habitats of Principal Importance in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The site is connected to other areas of ancient, deciduous and ghyll woodland, and wood pasture and parkland in the wider landscape.

Species

- 3.4 Bat species records within 2km of the site boundary from the last ten years are shown in Table 3.1 below.

Table 3.1: Desk study results

Species	Type of record	Approximate direction and distance from closest point of site boundary
Bechstein's bat	Grounded male bat	1.75km east
Brown long-eared bat	Several records of roosts/presence	Closest record 1.4km south
Common pipistrelle	Several records of roosts/presence	Closest record 150m south
Pipistrelle species	Roost – two bats	2km east
Soprano pipistrelle	Grounded bats and roost	1km west and 1.5km west
Whiskered bat	Grounded male bat	1km north-east
Myotis Bat	Roost -one bat	2km west
Daubenton's Bat	2 present during field observation	1.5km south-west

TRAPPING SURVEYS

- 3.5 A total of 67 bats from ten species were captured over nine nights between 6th June and 24th September 2022, over six different locations. Each location was surveyed one night per survey session (three nights in total in 2022).
- 3.6 Figure 2 in Appendix 1 shows the trapping locations for the surveys. The number of bats of each species that was caught is shown in Table 3.2 and the number of bats caught at each trapping location described in Table 2.1 is shown in Table 3.3 below.

Table 3.2: Number of bats caught by species

Species	Number of bats
Alcathoe bat	4
Barbastelle	1
Bechstein's bat	4
Brandt's bat	1
Brown long-eared bat	11
Common pipistrelle	13
Daubenton's bat	1
Natterer's bat	10
Soprano pipistrelle	10
Whiskered bat	10
Whiskered/Alcathoe bat	2

Table 3.3: Number of bats caught by location

Location	Trapping location description	Number of bats
1	Three locations – two within woodland and one on field edge	13
2	Three locations – one within Ridden's Wood, one on the edge of Ridden's Wood, and one on the edge of Furnace Wood	11
3	Three locations – one on edge of hazel coppice, one within hazel coppice, one adjacent to stream	12
4	Five locations – three within wet oak/alder woodland, and two on edge of wet oak/alder woodland	3
5	Four locations – three on woodland edge (one by stream), one within woodland by stream	17
6	Three locations – within woodland	11

- 3.7 A summary of the results for each species is provided below. Full details are provided in Appendix 2.

Alcathoe bat

- 3.8 Four Alcathoe bats were captured during surveys comprising two adult males, one breeding female, and one pregnant female. This species was captured during pre-maternity and post-maternity surveys, at Locations 2, 5 and 6.

Barbastelle

- 3.9 One barbastelle was captured during surveys. The bat was a juvenile male, captured during autumnal dispersal surveys, at Location 5.
- 3.10 The bat was selected for radio-tracking and is identified elsewhere throughout the report as Bat 4.

Bechstein's bat

- 3.11 Four male Bechstein's bats were captured during surveys. One was an adult, one was a young adult, and two juveniles. Bechstein's bats were captured during all three survey sessions, at Locations 1, 2, 3 and 6.
- 3.12 Three of the four Bechstein's bats were selected for radio-tracking. The young adult is identified elsewhere throughout the report as Bat 1, and the two juveniles as Bats 2 and 3.

Brandt's bat

- 3.13 One Brandt's bat, an adult male, was captured during the surveys. The bat was captured during the post-maternity survey session, at Location 2.

Brown long-eared bat

- 3.14 Eleven brown long-eared bats were captured during surveys. The bats comprised three breeding females, one non-breeding adult female, one juvenile, and six adult males. This species was captured during all three survey sessions, and captured at all locations.

Common pipistrelle

- 3.15 Thirteen common pipistrelles were captured during surveys. The bats comprised one pregnant female, two non-breeding adult females, one juvenile female, one juvenile male, six adult males, and two bats that escaped from the trap. This species was captured during all three survey sessions, and were captured at Locations 1, 2, 3, and 5.

Daubenton's bat

- 3.16 One Daubenton's bat, a non-breeding adult female, was captured during surveys. The bat was captured during the pre-maternity survey session, at Location 2.

Natterer's bat

- 3.17 Ten Natterer's bats were captured during surveys. The bats comprised three non-breeding adult females, three juvenile/immature females, and four adult males. This species was captured during all three survey sessions, at Locations 3, 5, and 6.

Soprano pipistrelle

- 3.18 Ten soprano pipistrelles were captured during surveys. The bats comprised four non-breeding females, five adult males, and one juvenile male. This species was captured during all three survey sessions, at Locations 1, 2, 3, 5 and 6.

Whiskered bat

- 3.19 Ten whiskered bats were captured during surveys. The bats comprised two post-lactating females, one pregnant female, one non-breeding female, four adult males, one juvenile male, and one male that was released before the age was determined. This species was captured during all three survey sessions, at Locations 1, 2, 3, and 5.

Small Myotis

- 3.20 Two bats that could not be identified to species level were captured during surveys (Bats 49 and 50) grouped as Small Myotis bats, likely to be either whiskered or Alcahoie bats. Both bats were juvenile males, captured during the post-maternity session at Location 4. The bats were released due to IUCN covid guidelines on bat handling (IUCN SSC Bat Specialist Group (BSG), 2021), before a dropping could be obtained for DNA analysis.

DNA Analysis

- 3.21 Droppings were obtained for DNA analysis from small Myotis bats (whiskered / Brandt's bat / Alcahoie bat) whenever possible. Two samples were sent to the

University of Warwick for analysis which confirmed the bats to be an Alcaho bat and a whiskered bat. Samples were not obtained for all small Myotis species (see Limitations section).

RADIO-TRACKING SURVEY

- 3.22 Four bats were selected for radio-tracking including three Bechstein's bats, and one barbastelle. No Alcaho bats were selected for radio-tracking as the individuals caught were too light to carry the radio-tags available (the bats needed to be a minimum weight of 5.4 grams).
- 3.23 All bats tagged were male, with Bat 1 being young adult, and Bats 2-4 being juveniles born in 2022.
- 3.24 The radio-tracking survey aimed to identify roosting locations, and flightlines from the roost wherever possible for the four radio-tagged bats. Radio-tagged bats are described in Table 3.4 below.

Table 3.4: Number and species of radio-tagged bats caught by species

Bat identification number	Species and breeding status	Date of capture	Location of capture
1	Bechstein's bat – male, last year's young	05/06/2022	3
2	Bechstein's bat – male – juvenile	01/08/2022	1
3	Bechstein's bat – male – juvenile	23/09/2022	6
4	Barbastelle – male – juvenile	24/09/2022	5

ROOST AND EMERGENCE SURVEY

- 3.25 A total of six confirmed roosting locations were identified from two of the radio-tagged bats. The locations of the roosts are shown in Table 3.5 below and in Appendix 1, Figure 3. All roosts were located outside the site boundary.

- 3.26 A total of four emergence surveys were undertaken on four of the confirmed roosts, the results of which are also shown in Table 3.5 below.
- 3.27 Four roosts were identified for Bat 1 (R1-4), all off site, with the closest identified approximately 410 metres (m) east (R4). Emergence surveys were undertaken on three of the roosts which recorded a peak count of one bat in two of the roosts (R2 and R4). The bat remained in its roost during the emergence survey undertaken on R1. An emergence survey was not undertaken on R3 as this roost was inaccessible.
- 3.28 Bat 3 was a juvenile Bechstein's bat radio-tracked in the autumnal dispersal session (September 2022). Two roosts were identified for this bat, the closest of which was approximately 300m from the site boundary. An emergence survey was undertaken on one of the roosts (R5) but no bats were recorded emerging from the roost and the radio-tracked bat remained within the tree. An emergence survey was not undertaken on R6 as this roost was inaccessible.
- 3.29 The roosts of Bat 2 and Bat 4 were not found, despite a thorough search of the site and all accessible areas up to 2km from the site boundary. This indicates the bats were likely roosting off site.

Table 3.5 Roost and emergence summary

Bat number	Roost identifier	Species	Sex	Breeding status	Estimated/ confirmed	Easting	Northing	Detail	Direction and distance from closest point of site boundary	Date of emergence survey	Roost count	Roost character- isation
1	R1	M.bec	M	Imm	Confirmed	531081	123410	Mature oak in tree line south of Copyhold Lane. 2x branch tear out visible at 8m and 10m on south-east. Diameter at breast height (DBH) approximately 60cm.	570m east	07/06/2022	0	Unknown
1	R2	M.bec	M	Imm	Confirmed	530940	123450	Immature aspen south of Copyhold Lane. Trunk cavity and callous (6cm internal width). Seems to extend upwards.	430m east	08/06/2022	1	Day
1	R3	M.bec	M	Imm	Confirmed	531456	124372	Mature oak tree south of Blunts Wood. Old tear out and callous which appears hollow, extending into branch. Lots of dead wood visible. Tree in mature tree line on bank of stream.	1.2km north east	N/A - access not possible	N/A	N/A
1	R4	M.bec	M	Imm	Confirmed	530929	123478	Young aspen at edge of wooded copse close to R2 south of Copyhold Lane. Multiple trunk cavities and callous wounds. Trunk appears hollow. Fractures facing NW out either 5m or 7m.	410m east	10/06/2022	1	Day
2	N/A	M.bec	M	juv	N/A	N/A	N/A	N/A no roost found	N/A	N/A	N/A	N/A
3	R5	M.bec	M	juv	Confirmed	530625	122940	Mature oak tree within Heasland Hanger	300m east	24/09/2022	0	Unknown

Bat number	Roost identifier	Species	Sex	Breeding status	Estimated/ confirmed	Easting	Northing	Detail	Direction and distance from closest point of site boundary	Date of emergence survey	Roost count	Roost character- isation
3	R6	M.bec	M	Juv	Confirmed	530829	122871	Oak tree within Hanger Wood	500m east	N/A access not possible	N/A	N/A
4	N/A	B.bar	M	Juv	N/A	N/A	N/A	N/A no roost found	N/A	N/A	N/A	N/A

FLIGHTLINES

- 3.30 A flightline for Bat 1 was recorded north/north-west from R2 on 8th June 2022, and north-west from R4 on 10th June 2022. The flightlines were recorded outside the site boundary, but the bat was recorded flying towards the site on both occasions.
- 3.31 A flightline from the roost was not discovered for Bat 2 as the roost was not found. However, the bat was suspected to be foraging in the west of Riddens Wood (based on single bearings taken during trapping surveys) on subsequent nights following capture. Signal from the radio-tagged bat was first heard around three hours after sunset, for approximately two-three hours on both 3rd and 4th August 2022.
- 3.32 A flightline from the roost was not discovered for Bat 3 as the bat was not recorded emerging from R5, and access for an emergence survey was not possible for R6.
- 3.33 A flightline from the roost was not discovered for Bat 4 as the roost was not found.

4 Evaluation

SPECIES ASSEMBLAGE

- 4.1 A total of 67 bats of ten species were captured over nine trapping nights over three survey sessions. The species included barbastelle, Bechstein's bat, Alcahloe bat, Brandt's bat, brown long-eared, common pipistrelle, Daubenton's bat, Natterer's bat, soprano pipistrelle, and whiskered bat, indicating a broad assemblage of bat species present within site.
- 4.2 Table 4.1 provides information on the UK and local distribution and conservation status of species captured on site. This shows that three species listed as 'very rare' by Sussex Bat Group (2019) were recorded on site (Bechstein's bat, barbastelle, and Alcahloe bat).

Table 4.1 Distribution and status of bats captured during trapping surveys

Species (* indicating breeding on or near the site)	Relative UK Distribution and Status (BCT, 2010)	Local Distribution & Status (Sussex Bat Group, 2019)
Bechstein's bat	Very rare, (restricted to southern Wales and parts of southern England)	Very rare
Barbastelle	Widespread, very rare	Widespread, very rare
Alcahloe bat*	Data deficient	Very rare, hardly known
Brandt's bat	Widespread, uncommon (slightly less common and widespread than Whiskered bat)	Widespread, scarce
Brown long-eared bat*	Widespread, relatively common	Relatively abundant, widespread
Common pipistrelle *	Widespread, common	Widespread, abundant
Daubenton's bat	Widespread, fairly abundant	Widespread, fairly abundant

Species (* indicating breeding on or near the site)	Relative UK Distribution and Status (BCT, 2010)	Local Distribution & Status (Sussex Bat Group, 2019)
Natterer's bat	Widespread, locally common	Widespread, scarce
Soprano pipistrelle	Widespread, common	Widespread, fairly common
Whiskered bat*	Widespread, scarce	Widespread, scarce

- 4.3 The majority of bats were captured during the pre-maternity session, with 30 bats caught in June, as shown in Table 4.2. Twenty bats were captured during the post-maternity session in August, and 17 in the autumnal dispersal session in September.
- 4.4 The location with the highest rate of capture over all survey sessions was location 5, an area characterised by woodland edge and a stream. The location with the highest rate of capture within a survey session was location 2, an area characterised by ancient woodland with a stream running through. This indicates the importance of woodland, woodland edge and riparian habitats on site.

Table 4.2 Bats caught per location and survey session

Trapping location	Pre-maternity	Post-maternity	Autumnal dispersal	Total
1	7	4	2	13
2	10	1	0	11
3	3	3	6	12
4	0	2	1	3
5	8	4	5	17
6	2	6	3	11
Total	30	20	17	67

- 4.5 The one barbastelle bat captured was at Location 5a, an area characterised by woodland edge and a stream. The Alcahoie bats were captured at Locations 2a, 5d, 6a and 6c, areas characterised by ancient woodland, woodland edge, and streams. The Bechstein's bats were captured at Locations 1b, 2a, 3a, and 6a, areas characterised by woodland (including ancient), hazel coppice, and streams. One of

the Bechstein's bats was also recorded foraging in the proximity of Location 1. This further indicates the importance of woodland, woodland edge and riparian habitats for these species of concern.

- 4.6 Breeding females from four species were trapped during surveys (shown by * in Table 4.1) including Alcathe bat, brown long-eared, common pipistrelle, and whiskered bat indicating the importance of the site and/or nearby area for breeding.

RADIO-TRACKING SURVEYS

Alcathe bat

- 4.7 The core sustenance zone (CSZ)¹ is considered to be 1km for this species. Although Alcathe bats were not radio-tracked during surveys, breeding females have been recorded on site. Therefore, due to the CSZ for this species, it is likely that maternity roosts are located within or closely adjacent to the site.
- 4.8 The site/nearby area is considered to be of importance at a regional level for Alcathe bats (Wray et al., 2010) due to this being one of the rarest species, the presence of maternity roosts nearby, and the suitable habitats on site.

Barbastelle

- 4.9 One juvenile male barbastelle was captured during the autumnal dispersal survey session. Barbastelle bats are typically associated with deciduous woodland, wet meadows, and waterbodies (BCT, 2016). This species commutes along hedgerows, riparian corridors, and treelines, all of which were targeted for trapping surveys. No roosts were identified for the radio-tracked barbastelle, indicating that the bat was not likely to be roosting on site, or within the nearby area. The site has therefore not been confirmed as providing an important roosting function for this species. Furthermore, no breeding individuals were captured during surveys, meaning the site cannot be confirmed as providing a breeding function for this species.

¹ The area around a communal roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost (BCT, 2016)

- 4.10 No flightlines were recorded for the radio-tracked barbastelle as the bat's roost was not identified. However, data from automated static bat detector surveys, and activity transects, provides information on how this species uses the site (Ecology Co-Op, 2023).
- 4.11 The site is considered to be of importance at a regional level (Wray et al., 2010) for barbastelle due to the rarity of this species, the presence of an individual caught during surveys, and the complex network/mosaic of habitats on site.

Bechstein's bat

- 4.12 Three Bechstein's bats were radio-tracked during surveys, two juveniles and one young adult.
- 4.13 A total of six roosts were identified for Bechstein's bats, with a peak count of one bat recorded during emergence surveys of accessible roosts.
- 4.14 A juvenile Bechstein's bat was radio-tracked in the post-maternity session (Bat 2) when the bat would likely still be roosting within a maternity colony. However, no roosts were identified for this bat, indicating that the maternity roost is unlikely to be on site.
- 4.15 Although flightlines for radio-tracked Bechstein's bats were not identified on site, Bat 2 was recorded foraging within the woodland in the south of the site, close to where the bat was caught. Although the site is not being used for roosting by this species, the woodlands were used as a foraging resource, indicating the importance of the area for this type of activity.
- 4.16 The site is considered to be of importance at a regional level (Wray et al., 2010) for Bechstein's bats due to the rarity of this species, the presence of bats captured during surveys, a small number of roosts/potential roosts nearby and a complex network/mosaic of suitable habitats on site.

RECOMMENDATIONS

- 4.17 It is recommended that the results of the trapping and radio-tracking surveys undertaken at the Ansty site are used, in conjunction with the other bat surveys undertaken on site (The Ecology Co-Op, 2023), to determine impacts to site and inform any necessary mitigation/compensation. Any mitigation should take the presence of Bechstein's bat, barbastelle and Alcaholic into account to ensure complex woodlands, including all Ancient Semi-Natural Woodland and riparian habitats are retained and protected. The impacts of lighting on bats should be considered and kept to a minimum with reference to best practice e.g. Institution of Lighting Professionals (2018), with details included within the masterplan design.

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Appendix 1: Survey Maps

Figure 1: Site Boundary Map

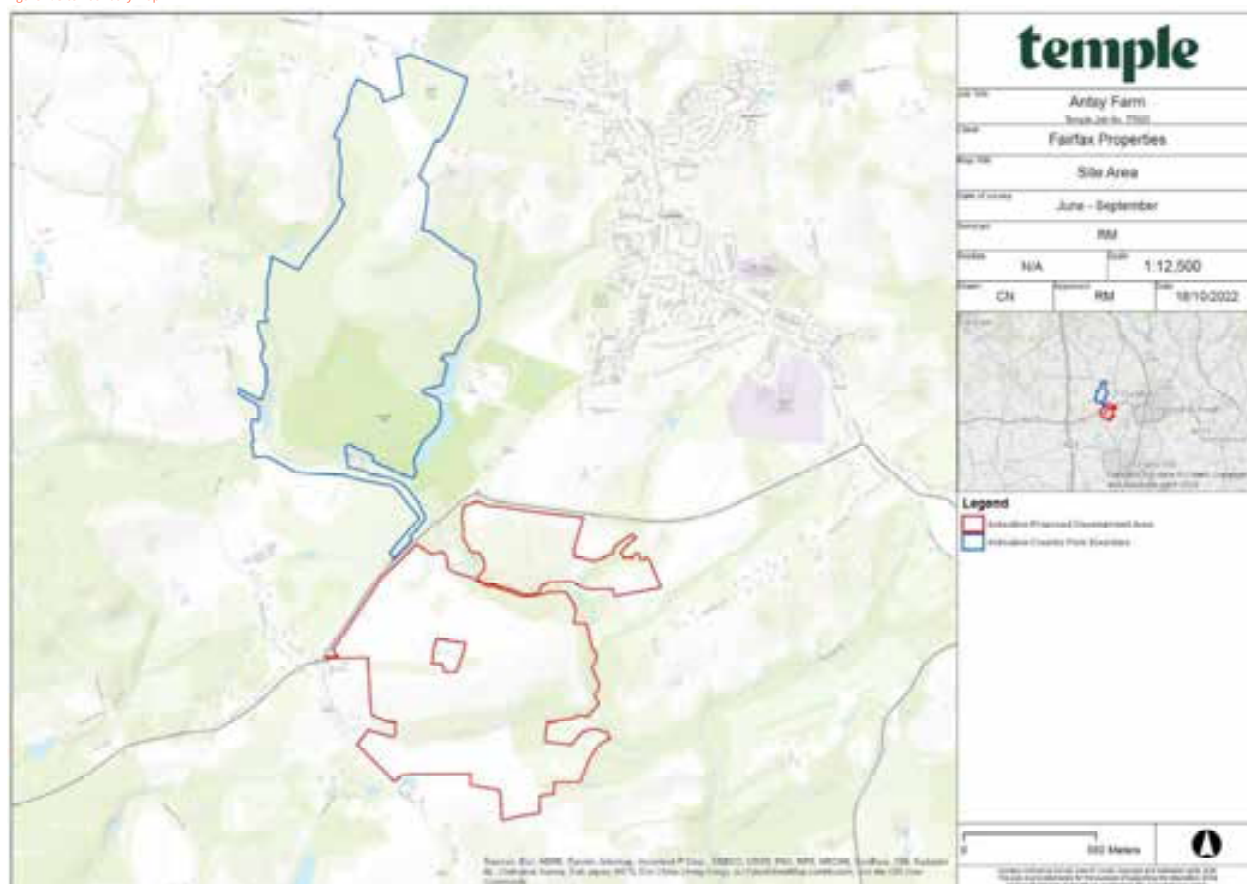


Figure 2: Trapping Locations

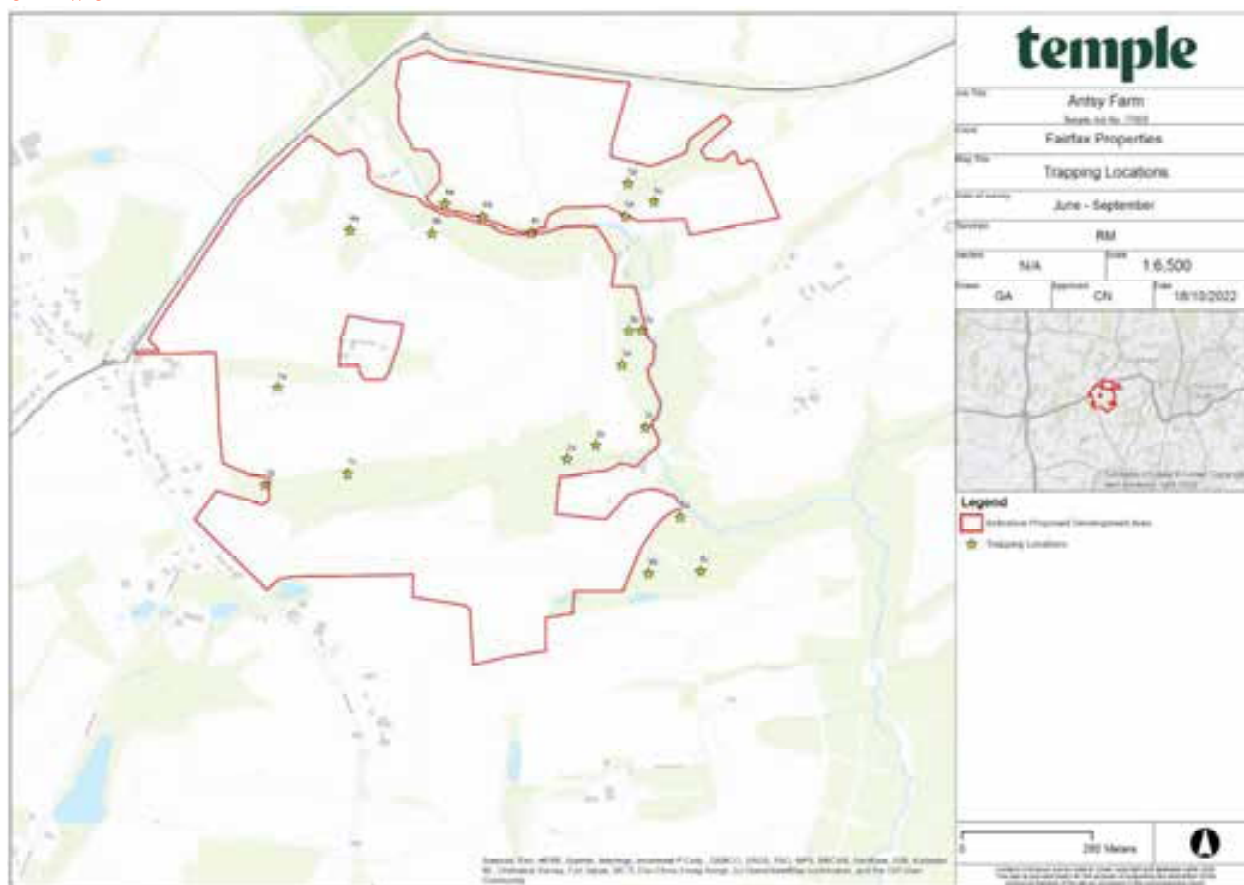
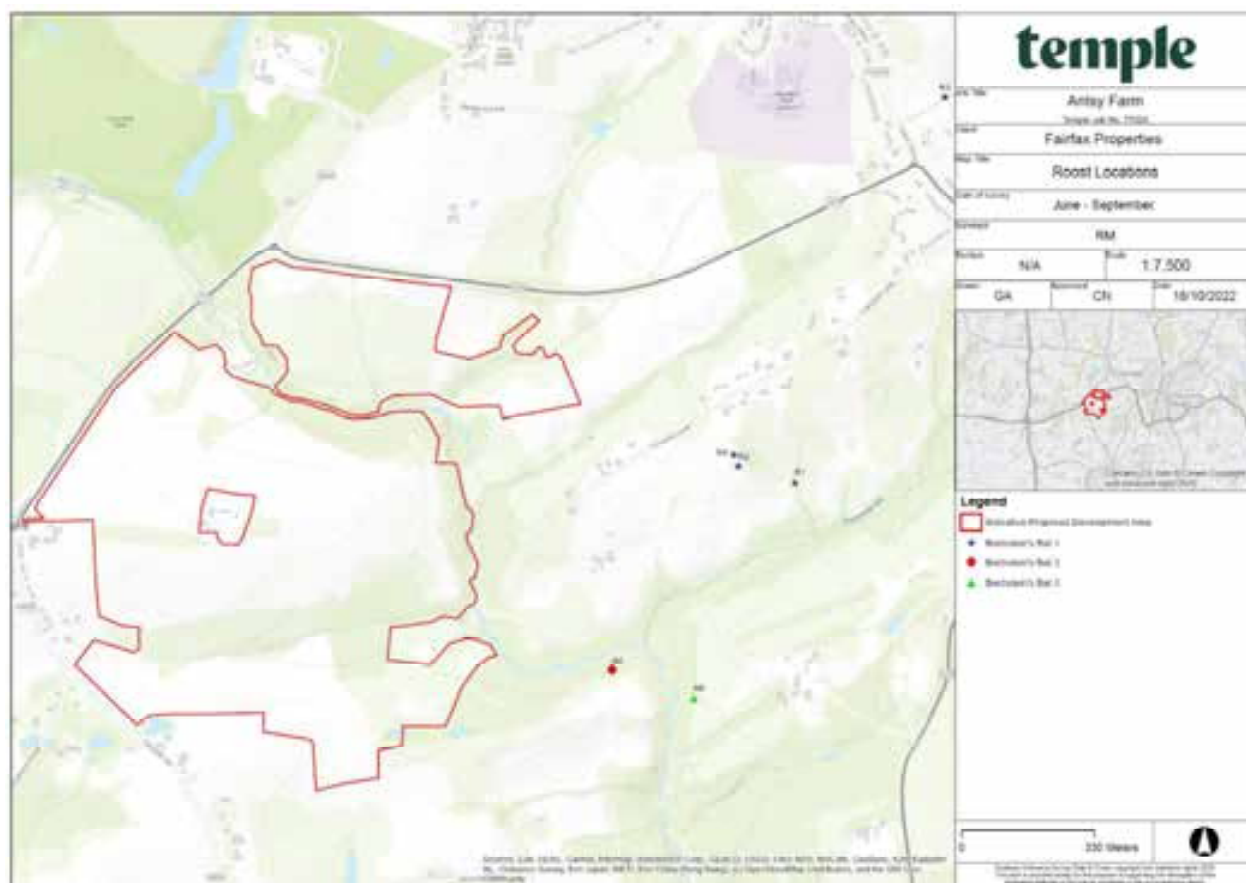


Figure 3: Roost Locations



Appendix 2: Survey data

Trapping roundsheet:

Date	Bat No.	Time (24hr)	Trap	Species	M/F	Juv/ Imm/ Ad	Testes size 0-2	Par / NP / Preg / Lact	Forearm (mm)	Bat weight (g)	ID features, damage, parasites photos and samples collected
08/06/2022	1	22:15	5c	P.pip	F	Ad		Preg			Released at trap
08/06/2022	2	22:15	5c	P.aur	M	Ad	1				Released at trap
08/06/2022	3	22:45	5c	P.pyg	M	Ad	1				Released at trap
08/06/2022	4	00:15	5a	M.nat	M	Ad	1				Released at trap
08/06/2022	5	00:15	5a	M.nat	F	Ad		NP			Released at trap
08/06/2022	6	00:30	5d	M.alc	M	Ad	1		32.8	4.7	No droppings
08/06/2022	7	00:45	5a	P.pip	M	Ad	1				Released at trap
08/06/2022	8	00:45	5c	P.pyg	F	Ad		NP			Released at trap
07/06/2022	9	22:30	6c	P.aur	M	Ad	1				Released at trap
07/06/2022	10	01:00	6c	P.aur	F	Ad		Par			Released at trap
07/06/2022	11	21:30	2b	P.pip							Escaped from trap
07/06/2022	12	22:35	2a	M.alc	F	Ad		Preg	32	4.73	Short tragus, pale at base
07/06/2022	13	23:30	2b	P.pyg	M	Ad	2				Released at trap
07/06/2022	14	23:30	2b	P.aur	M	Ad	1				Released at trap
07/06/2022	15	00:30	2b	M.dau	F	Ad		NP			Released at trap
07/06/2022	16	01:45	2a	M.bec	M	Ad					Bat escaped from bag
07/06/2022	17	02:05	2b	M.mys	F	Ad		Preg			Advanced pregnancy. released
06/06/2022	18	23:00	1a	P.pyg	M	Ad	1				Released at trap
06/06/2022	19	23:15	1a	P.pyg	M	Ad	1				Released at trap
06/06/2022	20	23:45	1a	P.pyg	F	Ad		NP			Released at trap

Date	Bat No.	Time (24hr)	Trap	Species	M/F	Juv/ Imm/ Ad	Testes size 0-2	Par / NP / Preg / Lact	Forearm (mm)	Bat weight (g)	ID features, damage, parasites photos and samples collected
06/06/2022	21	01:45	1a	P.pyg	F	Ad		NP			Released at trap
06/06/2022	22	02:30	1b	M.mys	M	Ad	1				Released at trap.
06/06/2022	23	02:45	1c	M.mys	M	Ad	1				Released at trap
06/06/2022	24	02:45	1c	P.pip	M	Ad	1				Released at trap
06/06/2022	25	00:00	3a	M.bec	M	Imm			40.05	8	Bat #1 tagged, frequency 173.0425, ring J3719
06/06/2022	26	01:30	3a	P.pip							Released at trap
06/06/2022	27	02:35	3a	M.mys	M	Ad			36.3		Measurements taken to confirm species including hand lens check of teeth, penis morphology, tragus length above notch, colour at base of tragus, nostril shape, and colour of face
08/06/2022	28	22:15	2a	P.pip	F	Ad		NP			Released at trap
08/06/2022	29	23:20	2a	P.pip	M	Ad					Released at trap
08/06/2022	30	23:20	2b	P.pip	F	Ad		NP			Released at trap
01/08/2022	31	21:25	1a	P.pip	M						Released at trap

Date	Bat No.	Time (24hr)	Trap	Species	M/F	Juv/ Imm/ Ad	Testes size 0-2	Par / NP / Preg / Lact	Forearm (mm)	Bat weight (g)	ID features, damage, parasites photos and samples collected
01/08/2022	32	01:40	1b	M.mys	M				33		Released at trap. Measurements taken to confirm species including hand lens check of teeth, penis morphology, tragus length above notch, colour at base of tragus, nostril shape, and colour of face
01/08/2022	33	01:40	1b	M.bec	M	Juv	0		42.6	9	Bat #2 tagged, frequency 173.1021, ring number J3722 (left wing)
01/08/2022	34	02:10	1c	P.pip	F	Juv		NP			Released at trap
01/08/2022	35	21:45	3b	P.aur	M	Ad	0				Released at trap
01/08/2022	36	21:45	3b	M.nat	F	Ad		NP		6.58	Mites and wing holes
01/08/2022	37	22:35	3e	M.mys	M	Juv	1		34	4.72	5th finger >42mm, dark face and tragus
02/08/2022	38	20:55	6c	P.pyg	F	Ad		NP			Released at trap
02/08/2022	39	21:55	6b	P.aur	F	Ad		NP			Released at trap
02/08/2022	40	22:35	6c	P.pyg	M	Juv	0				Released at trap
02/08/2022	41	23:30	6c	M.alc	M	Ad			32.2	5	Dark face and tragus / sample taken and

Date	Bat No.	Time (24hr)	Trap	Species	M/F	Juv/ Imm/ Ad	Testes size 0-2	Par / NP / Preg / Lact	Forearm (mm)	Bat weight (g)	ID features, damage, parasites photos and samples collected
											confirmed as Alcaethoe
02/08/2022	42	01:30	6b	P.aur	F	Ad		Par			Released at trap
02/08/2022	43	02:00	6a	M.alc	F	Ad		Par	32.1	4.5	Dark face and tragus / not post lact this year / tragus below notch
02/08/2022	44	09:36	2b	M.bra	M	Ad	0		33		ID'd using penis shape and tragus
03/08/2022	45	21:10	5b	M.nat	M	Ad	1		37.4	6.5	Released at trap
03/08/2022	46	23:00	5d	P.pip	M	Ad	1				Released at trap
03/08/2022	47	03:05	5d	M.nat	F	Juv		NP			Released at trap
03/08/2022	48	02:40	5b	P.pip	M	Juv					Released at trap
03/08/2022	49	23:30	4c	M.mys/alc	M	Juv			32.5	4	Impossible to differentiate this individual on biometrics alone and no droppings were obtained. Bat released to limit exposure as per IUCN guidelines.
03/08/2022	50	23:30	4c	M.mys/alc	M	Juv			32.6	4.2	Impossible to differentiate this individual on

Date	Bat No.	Time (24hr)	Trap	Species	M/F	Juv/ Imm/ Ad	Testes size 0-2	Par / NP / Preg / Lact	Forearm (mm)	Bat weight (g)	ID features, damage, parasites photos and samples collected
											biometrics alone and no droppings were obtained. Bat released to limit exposure as per IUCN guidelines.
22/09/2022	51	20:10	1c	P.aur	M	Ad					Released at trap
22/09/2022	52	22:45	1c	P.aur	M	Ad					Released at trap
22/09/2022	53	19:50	3c	P.aur	F	Juv		NP			
22/09/2022	54	20:35	3b	M.nat	F	Ad		NP			
22/09/2022	55	20:40	3c	P.pyg	M	Ad	1				
22/09/2022	56	20:45	3a	M.nat	M	Ad	1		39.6		
22/09/2022	57	22:55	3c	M.mys	M	Ad	1		34.9	5.15	Straight penis, forearm outside Alcatraz range
22/09/2022	58	23:00	3a	M.mys	F	Ad		Post lactating	34.1	4.39	Sample taken but no protocone visible, confirmed as whiskered bat from DNA analysis.
23/09/2022	59	20:45	6b	M.nat	M	Ad	1			6	
23/09/2022	60	20:45	6b	M.nat	F	Juv		NP	37.1	7.5	
23/09/2022	61	22:15	6a	M.bec	M	Juv	0		36.8	8	Bat #3 frequency 173.2420, ring number J3723

Date	Bat No.	Time (24hr)	Trap	Species	M/F	Juv/ Imm/ Ad	Testes size 0-2	Par / NP / Preg / Lact	Forearm (mm)	Bat weight (g)	ID features, damage, parasites photos and samples collected
24/09/2022	62	21:15	4d	P.aur	F	Ad		Parous			
24/09/2022	63	20:00	5a	M.nat	F	Imm		NP	39.7	7	Mite on wing
24/09/2022	64	20:00	5a	B.bar	M	Juv	0		39.2	8	Bat #4 frequency 173.1605, ring number J3747
24/09/2022	65	20:35	5b	P.pip	M	Ad	1				
24/09/2022	66	21:00	5b	M.mys	F	Ad		Post lactating	33.5	4	Measurements taken to confirm species incl. hand lens check of teeth, tragus length above notch, colour at base of tragus, nostril shape, and colour of face
24/09/2022	67	21:05	5a	M.mys	F	Ad		NP	32.8	5	Measurements taken to confirm species incl. hand lens check of teeth, tragus length above notch, colour at base of tragus, nostril shape, and colour of face



9 September 22

Re: Identification Results for Milla Timms, The Temple Group

Job number 18785, received 30 August 2022

Sample labelled: POP002707 Ansty Aug Rm

PCR amplification successful. DNA sequence:

ATGACCAACATTGAAAAATCCCACCCTTTAATAAAAATCATTAACTCATTATTGA
C

Phylogenetic analysis identification: *Myotis alcaethoe*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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18 October 22

Re: Identification Results for Milla Timms, The Temple Group

Job number 19042, received 06 October 2022

Sample labelled: Ansty T7026

PCR amplification successful. DNA sequence:

ATGACCAACATTTCGAAATCCCACCCCTTAGTAAAAATTATTAATAGCTCATTATCGAC
CTTCTGCCCATCAAATATCTCATCTTGATGAAATT

Phylogenetic analysis identification: *Myotis mystacinus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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Appendix 3: Legislation

Important Notice: This section contains details of legislation applicable in England and Wales only (i.e. not including Scotland, the Isle of Man, Northern Ireland, the Republic of Ireland or the Channel Islands) and is provided for general guidance only. While every effort has been made to represent the current (at the time of writing) situation with respect to the UK's position outside of the EU and to ensure accuracy throughout, this section should not be relied upon as a definitive statement of the law.

Over the past few years, three important bills have been published which are intended to shape how growing pressures on the environment post-Brexit (post-transition period) are tackled. Both the Agriculture Bill and Fisheries Bill gained Royal Assent in November 2020 and are now the Agriculture Act 2020 and Fisheries Act 2020 respectively; and, more recently, the Environment Bill was passed into law in November 2021, becoming the Environment Act 2021. *N.B. as environment policy is a devolved matter, most of this Act applies to England only.*

A LEGISLATION AFFORDED TO SPECIES

The objective of the EC Habitats Directive² is to conserve the various species of plant and animal which are considered rare across Europe. The Directive is transposed into UK law by **The Conservation of Habitats and Species Regulations 2017 (as amended)** and **The 'Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended)**.

Various amendments to the 2017 Regulations in England and Wales have been made through the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. These changes came into effect on the 1 January 2021 following the UK's departure from the EU and the end of the Transition Period. The changes are largely limited to 'operability changes' that will ensure the Regulations can continue to have the same working effect as before.

² Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora

The Wildlife and Countryside Act 1981 (as amended) is a key piece of national legislation which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and implements the species protection obligations of Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

Since the passing of the Wildlife & Countryside Act 1981, various amendments have been made, details of which can be found on www.opsi.gov.uk. Key amendments have been made through the Countryside and Rights of Way (CRoW) Act (2000).

As well as delivering long-term targets to reduce waste and improve resource efficiency and improve air and water quality targets, the **Environment Act 2021** aims to halt the decline of nature by 2030, mandates Biodiversity Net Gain for developments in England and amends the Wildlife and Countryside Act 1981 (as amended) to introduce an additional purpose for granting a protected species licence in relation to development which is ‘for reasons of overriding public interest’. The Act also introduces the Office for Environmental Protection (OEP), which will be a new public body intended to hold government and public authorities to account, although the government will be able to issue guidance to the OEP on how it enforces policies and legislation.

Some of the key biodiversity elements in the Act that will have a bearing on species protection in the UK include:

- A strengthened biodiversity duty on Local Planning Authorities;
- Biodiversity net gain to ensure developments, including Nationally Significant Infrastructure Projects (NSIP), deliver at least 10% increase in biodiversity;
- Local Nature Recovery Strategies to support a Nature Recovery Network;
- Duty upon Local Authorities to consult on street tree felling;
- Strengthen woodland protection enforcement measures;
- Conservation Covenants;
- Protected Site Strategies and Species Conservation Strategies to support the design and delivery of strategic approaches to deliver better outcomes for nature;

- Introduces the power for the Habitats Regulations to be amended or ‘refocused’ to ‘to deliver creative public policy thinking that delivers results’.

This section does not provide further detail on the Environment Act 2021 as, at the time of writing (November 2021), the Act, in its final form, has not been published and it remains to be seen how and when the various elements will be enacted at a national and local level.

Other legislative Acts affording protection to wildlife and their habitats include:

- Salmon and Freshwater Fisheries Act 1975;
- Deer Act 1991;
- Protection of Badgers Act 1992;
- Wild Mammals (Protection) Act 1996;
- Countryside and Rights of Way (CROW) Act 2000;
- Natural Environment & Rural Communities (NERC) Act 2006;
- The Eels (England and Wales) Regulations 2009; and
- Environment (Wales) Act 2016.

Species and species groups that are protected or otherwise regulated under the aforementioned legislation, and that are most likely to be affected by development activities, include herpetofauna (amphibians and reptiles), badger, bats, birds, dormouse, invasive species, otter, plants, red squirrel, water vole and white clawed crayfish.

Explanatory notes relating to species protected under The Conservation of Habitats and Species Regulations 2017 (as amended), which includes smooth snake, sand lizard, great crested newt, natterjack toad, all bat species, otter, dormouse and some plant, invertebrate and fish species, are given below. **These should be read in conjunction with the relevant species sections that follow.**

- In the Habitats Directive, the term ‘deliberate’ is interpreted as being somewhat wider than intentional and may be thought of as including an element of recklessness.
- The Conservation of Habitats and Species Regulations 2017 (as amended) does not define the act of ‘migration’ and therefore, as a precaution, it is recommended that

short distance movement of animals for e.g. foraging, breeding or dispersal purposes are also considered where relevant.

- In order to obtain a mitigation licence for species protected under the Conservation of Habitats and Species Regulations 2017 (as amended), the application must demonstrate that it meets all of the following three 'tests': i) the action(s) are necessary for the purpose of preserving public health or safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequence of primary importance for the environment; ii) that there is no satisfactory alternative and iii) that the action authorised will not be detrimental to the maintenance of the species concerned at a favorable conservation status in their natural range.

BATS

All species of bat are fully protected under The Conservation of Habitats and Species Regulations 2017 (as amended) through their inclusion on Schedule 2. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of Schedule 2 species (e.g. all bats);
- Deliberate disturbance of bat species as:
 - a) to impair their ability:
 - to survive, breed, or reproduce, or to rear or nurture young; or
 - to hibernate or migrate.
 - b) to affect significantly the local distribution or abundance of the species.
- Damage or destruction of a breeding site or resting place; and
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

Bats are also protected under the Wildlife and Countryside Act 1981 (as amended) in respect to sub-sections 9 (4) (b) and (c) and 9 (5) through their inclusion on Schedule 5. Under this Act, they are additionally protected from:

- Intentional or reckless disturbance while in their place of shelter (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection

- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

How is the legislation pertaining to bats liable to affect development works?

The appropriate licence issued by the relevant countryside agency (e.g. Natural England, Natural Resources Wales) will be required for works liable to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licence is to derogate from the relevant legislation but also to enable appropriate mitigation measures to be put in place and their efficacy to be monitored.

Though there is no case law to date, the legislation may also be interpreted such that, in certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded protection, for example, where it can be proven that the continued usage of such areas is crucial to maintaining the integrity and long-term viability of a bat roost³.

³ Garland and Markham (2008) Is important bat foraging and commuting habitat legally protected? Mammal News, No. 150. The Mammal Society, Southampton.

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Appendix G3: Beechy Bottom Parkland Reserve EcIA

Ecological Impact Assessment (EclA)				
Beechy Bottom Parkland Reserve Ansty Mid-Sussex RH17 6JB				
Planning Reference:		Report Reference:	220918 rev01	
Client:	Fairfax Acquisitions Ltd.			
Architect/Agent:	N/A			
Survey Date/s:	2022: February, April & October 2023: April – October			
Report Date:	October 2023	OS Grid Ref:	TQ 292 246	
Report Author:	Dominic Sheldon BSc PGCert ACIEEM TechArbor A			
Approved By:	Andrew Charles BSc (Hons), MSc, MCIEEM			
Surveyor & Licence N°:	Dominic Sheldon	Dormouse: 2015-18348-CLS (WML-CL10a) Bats: 2016-20473-CLS-CLS (WML-A34) Badger: 067 (CL35) & (Scottish Class License) Ecologist All Operations - Licence 182943		
	Andrew Charles	Bats: 2015-13738-CLS-CLS (Level 2) Dormouse: 2016-21680-CLS-CLS Great Crested Newt: 2016-20368-CLS-CLS		
Additional surveyor/s:	Aby Sampson, Paul Lott, Lee Knight, Erin Reardon			

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DISCLAIMER

It should be noted that this report is context-specific. If any changes are made to the brief and/or the development proposal Ecologic Consultant Ecologists LLP must be informed, as amendments may be required. The information provided in this report must be reviewed and updated in the time following twelve months from the date of survey. This report (including any enclosures and attachments) has been prepared for the exclusive use and benefit of the addressee(s) and solely for the purpose for which it is provided. Unless we provide express prior written consent, no part of this report should be reproduced, distributed or communicated to any third party. Ecologic Consultant Ecologists LLP do not accept any liability if this report is used for an alternative purpose from which it is intended, nor to any third party in respect of this report.

1.1 Introduction

It is proposed to develop the existing site (currently known as Cuckfield Park) site into 'Beechy Bottom Parkland Reserve', a site with enhanced public access and associated infrastructure together with large areas set aside for a non-deterministic approach to habitat and species restoration as a goal, which the author has termed "constrained rewilding" (non-equilibrium ecology and conservation – see Section 5.1).

The site comprised of bracken g1c, other neutral grassland g3c, *Lolium-Cynosurus* neutral grassland g3c6, modified grassland g4 (also designated as wood-pasture and parkland w(26)), lowland mixed deciduous woodland w1f (also designated and Semi-natural Ancient Woodland SNAW), other broadleaved woodland w1g, dense scrub h3, ponds r1, developed land, sealed surface u1b, artificial unvegetated unsealed surface u1c and other rivers and streams r2b. Linear habitats also recorded included native hedgerow h2a6 and species-rich native hedgerow with trees h2a5 (1) (see Figure 1). The site was approximately 109.53 ha.

1.2 Study Purpose

An Ecological Impact Assessment (EclA), including a Preliminary Ecological Appraisal (PEA) comprising a UKHabs survey, as well as a suite of baseline ecological receptor and protected species surveys, were undertaken to assess the perceived ecological impacts associated with this proposal, including any perceived impacts to: legally protected species or species of conservation concern; legally protected habitats or habitat of conservation concern; any statutory or non-statutory sites of conservation interest; and opportunities to provide biodiversity enhancement(s).

1.3 Site Ecology

The site has potential for/supports:

- Amphibians – the scrub, woodland, ponds and hedgerow bases provide suitable terrestrial and aquatic breeding habitat for common & widespread amphibian species with moderate numbers of toad *Bufo bufo*, smooth newt *Lissotriton vulgaris* as well as great crested newt *Triturus cristatus*, which were all recorded as present on site;
- Badger *Meles meles* – [REDACTED]

- Bats:
 - Foraging & dispersal: the site supports moderate levels of foraging and dispersal activity for a high diversity of bat species;
 - Roosting: eight trees on the site included potential bat roosting features (PRF).
- Birds – the site supports a wide range of bird species which have been recorded as breeding on site, with habitats providing nesting and foraging opportunities for a wide range of woodland and open habitat bird species;
- Dormouse – the scrub, woodland and hedgerow provide habitat for dormouse;
- Hedgehog *Erinaceus europaeus* – the site is likely to provide foraging and dispersal habitat for hedgehog;
- Reptiles – the site supports a 'good' breeding population of slow worm *Anguis fragilis* and a 'good' breeding population of grass snake *Natrix helvetica*;
- Invertebrates – the site supports a range of aquatic invertebrate species and also provides habitat for common and widespread terrestrial invertebrate species; and,
- Non-native botanical species – a series of non-native invasive plants such as *Rhododendron ponticum* and least duckweed *Lemna minuta* both listed on Schedule 9 of the Wildlife & Countryside Act 1981 and the invasive non-native winter heliotrope, are present on site.

1.4 Key Impacts

Proposed plans indicate that the site will include the retention of the formal sports pitches, dedicated areas for dog walking, enhanced public access (with associated infrastructure), including a series of new woodland rides and glades, a cycle trail, the construction of an observation tower allowing views towards the South Downs, public parking provision and a large area of the site set aside for a non-deterministic approach to habitat and species restoration termed "constrained rewilding".

Accordingly, ecological impacts are considered as follows:

- The removal of areas of modified grassland (g4) within the site to make way for a series of pedestrian and cycle paths;
- The construction of a series of rides and glades within the other broadleaved woodland w1g, located on the western part of the site; and,
- The construction of a viewing platform within an area of wood pasture and parkland.

1.5 Mitigation & Compensation Measures

Key mitigation measures are to include:

- Precautions required to allow removal of modified grassland (g4), other broadleaved woodland w1g and hedgerow vegetation, to be informed by a Construction Ecological Management Plan (CEMP), including:
 - Reptiles: A reptile habitat manipulation program will be required prior to path construction works, encouraging reptile species (& amphibians) into "constrained rewilding" area;
 - Birds: avoidance of tree and hedgerow management or removal during the bird nesting season, or following nesting bird check/s;
 - Protection of retained boundary hedgebanks, habitats and trees, including mature, veteran & ancient parkland trees; and,
- Removal of the Schedule 9 species *Rhododendron ponticum* from the woodland, and the least duckweed *Lemna minuta* from Ponds 1 & 4. The invasive non-native winter heliotrope *Petasites fragrans*, recorded in the south-west corner of the site should also be removed from site by experienced professionals.

Compensation measures, should include:

- Habitat creation: following the Habitat & Ecological Restoration Management Plan (Tadorna Consulting, 2023) to include the creation of 60 parkland trees, woody scrub, pond restoration as well as the introduction of cattle and pigs as stock to help manage the park;
- Installation of six tree mounted bat boxes/towers (capable of maternity and hibernation roosting) as well as 20 bird boxes onto suitable trees within the site (Appendices 6 & 7);
- Creation of three reptile hibernacula, consisting of logs, brash and/or turf 2 m², within relatively undisturbed south-facing/non-shaded areas of the site (Appendix 8);
- Veteranisation of a proportion of the semi-mature poplar trees located within the other broadleaved woodland w1g, located on the western part of the site;
- The planting of 60 parkland trees within the wood-pasture and parkland located on site;
- The introduction of low numbers of pigs *Sus domestica* and rare breed cattle *Bos taurus* to the site, allowing access to grassland and woodland habitats;
- The electro-fishing of the existing carp ponds on site, creating two ponds to be retained for their wildlife interest;

- The removal of carp from these two ponds will result in a reduction in water pollution in terms of sediment loading and nitrates into the River Adur, located to the south of the site;
- The management of habitat for reptiles, amphibians (including great crested and smooth newt), birds, mammals (including dormouse, bat species and hedgehog) and invertebrate species
- Future management of retained and created habitats on and/or off-site, to be informed by the Habitat & Ecological Restoration Management Plan (Tadorna Consulting, 2023)

1.6 Conclusions

Without mitigation, the proposed development represents a minor negative ecological impact, through removal of a limited extent of habitat for amphibians, badger, bats, birds, hedgehog, and reptiles.

Compliance with 20% Biodiversity Net Gain in relation to separate development and implementation of ecology mitigation, compensation and enhancement measures, and the Habitat & Ecological Restoration Management Plan (Tadorna Consulting, 2023) is considered to represent a major gain for biodiversity overall.

Local Planning Authority Check List & Biodiversity Budget

Habitat, Species & Feature	Impact	Specific further survey:		Precautionary recommendations, avoidance, mitigation, compensation &/or enhancement	Biodiversity Budget: + or -
		Required	Complete		
Habitats	Removal of: Modified grassland and very small sections of hedgerow	No	N/A	It will be required to formulate a landscape strategy including sufficient habitat creation/enhancement to provide a measurable 20% net gain within the Biodiversity Metric 3.1. Development scheme to include restoration/habitat creation of wildlife habitats, including hedgerow, species-diverse grassland, scrub development and ponds. Retained, enhanced & created habitats, to be informed by Habitat & Ecological Restoration Management Plan The retained trees are to be protected with tree protective measures during construction Future management of retained and created habitats to be informed by the Habitat & Ecological Restoration Management Plan	Positive
Amphibians	Removal of a proportion of the modified grassland habitat Potential for injury or death of amphibians during clearance of modified grassland	Yes	Yes	Habitat creation and habitat restoration strategy to provide opportunities for amphibians Habitat pile/s to be created in relatively undisturbed locations within the site (in combination with reptiles) Pond restoration to take place on Ponds 1 & 4 as well as the carp ponds Retained, enhanced & created habitats, to be informed by Habitat & Ecological Restoration Management Plan	Positive
Bats	Foraging & Dispersal: Development will not remove habitat for foraging bat species	No	Yes	Development scheme to include restoration/habitat creation of wildlife habitats, including hedgerow, species-diverse grassland, scrub development and ponds, which provide greatly increased foraging opportunities within the site. Retained, enhanced & created habitats, to be informed by Habitat & Ecological Restoration Management Plan	Positive
	Roosting: Eight trees with potential bat roosting features (PRF) were identified on site. Many more trees with roosting features considered likely.	No	N/A	It is understood that trees with PRF's are to be retained. Six tree mounted bat boxes/towers with maternity and hibernation potential to be installed. A number of bat roosts to be created within veteranized trees located on site.	Positive

Habitat, Species & Feature	Impact	Specific further survey:		Precautionary recommendations, avoidance, mitigation, compensation &/or enhancement	Biodiversity Budget: + or -
		Required	Complete		
Badgers	[REDACTED]	No	N/A	Retained, enhanced & created habitats, to be informed by Habitat & Ecological Restoration Management Plan Development scheme to include restoration/habitat creation of wildlife habitats, including hedgerow, species-diverse grassland, scrub development and ponds, which provide greatly increased foraging opportunities within the site. Avoidance of single-hole outlier sett recommended. If this cannot be achieved, the closure of this sett under licence is recommended.	Positive
Birds	Development will remove extremely limited general nesting & foraging habitat for birds species.	No	Yes	Retained, enhanced & created habitats, to be informed by Habitat & Ecological Restoration Management Plan Development scheme to include restoration/habitat creation of wildlife habitats, including hedgerow, species-diverse grassland, scrub development and ponds, which provide greatly increased foraging and nesting opportunities within the site. A large number of species specific bird nesting provisions to be created within veteranized trees located on site. 20 tree mounted open fronted bird boxes to be installed on suitable trees within the SNAW woodland located on site.	Positive
Hedgehog	Removal of foraging limited area habitat. Fragmentation of habitat.	No	N/A	Retained, enhanced & created habitats, to be informed by Habitat & Ecological Restoration Management Plan Any excavations or pipework, which are to remain open overnight, should be fenced or covered to prevent potential access by wildlife species Development scheme to include restoration/habitat creation of wildlife habitats, including hedgerow, species-diverse grassland, scrub development and ponds, which provide greatly increased foraging, nesting and hibernation opportunities within the site.	Positive

Habitat, Species & Feature	Impact	Specific further survey:		Precautionary recommendations, avoidance, mitigation, compensation &/or enhancement	Biodiversity Budget: + or -
		Required	Complete		
Invertebrates	Very limited loss of foraging resources and shelter through habitat removal. Temporary disturbance of Ponds 1 & 4 through dredging and re-profiling.	No	Yes	Retained, enhanced & created habitats, to be informed by Habitat & Ecological Restoration Management Plan Development scheme to include restoration/habitat creation of wildlife habitats, including hedgerow, species-diverse grassland, scrub development and ponds, which provide greatly increased habitat opportunities within the site. Habitat pile/s to be created in relatively undisturbed locations within the site (in combination with reptiles)	Positive
Reptiles	Removal of a proportion of the modified grassland habitat located in close proximity to reptile species recorded on site Potential for injury or death of amphibians during clearance of modified grassland	Yes	Yes	The site supports a 'good' population of slow worm and barred grass snake, which will require habitat manipulation in order to encourage reptile species away from the working areas. Development scheme to include restoration/habitat creation of wildlife habitats, including hedgerow, species-diverse grassland, scrub development and ponds, which provide greatly increased foraging, basking and hibernation opportunities within the site. Habitat pile/s to be created in relatively undisturbed locations within the site (in combination with reptiles)	Positive

2.1 Background & Survey Objective

The site is approximately 109.53ha (see Figure 2.1) and is comprised of a former historic deer park (de-parked in 1618). The site is currently comprised of areas of dense bracken g1c, other neutral grassland g3c, Lolium-Cynosurus neutral grassland g3c6, modified grassland g4, wood-pasture and parkland w(26), lowland mixed deciduous woodland (also designated and Semi-natural Ancient Woodland SNAW), w1f, other broadleaved woodland w1g, dense scrub h3, ponds r1, developed land, sealed surface u1b, artificial unvegetated unsealed surface u1c and other rivers and streams r2b. Linear habitats also recorded included ecologically viable line of trees w1 (34), native hedgerow h2a6 and species-rich native hedgerow with trees h2a5 (1) (see Appendix 1).

It is proposed to develop the site to into 'Beechy Bottom Parkland Reserve'. This will involve the retention of the formal sports pitches, dedicated areas for dog walking, enhanced public access (with associated infrastructure), including a series of new woodland rides and glades, a cycle trail, an observation tower allowing views towards the South Downs, public parking provision and a large area of the site set aside for a non-deterministic approach to habitat and species restoration termed "constrained rewilding".

An Ecological Impact Assessment (EclA), including a Preliminary Ecological Appraisal (PEA), National Vegetation Communities (NVC) survey and a series of protected species surveys, including bat activity survey (manual transects and automated recording), breeding bird, great crested newt (HSI & eDNA), reptile, otter, water vole, and dormouse surveys. In addition to these protected species surveys, a number of general wildlife surveys were also undertaken as part of the baseline monitoring for the site, including: butterfly transects, moth trapping, terrestrial invertebrate, bryophyte and freshwater invertebrate surveys being undertaken.

These surveys were undertaken to assess the perceived ecological impacts associated with this proposal, including:

- Legally protected species or species of conservation concern;
- Legally protected habitats or habitat of conservation concern;
- Any statutory or non-statutory sites of conservation interest; and,
- Opportunities to provide biodiversity enhancement/s.

2.2 Site Description

The site is located approximately 550m to the west of the village of Cuckfield, Mid-Sussex. The site was originally a deer park serving the Tudor Cuckfield Park House, located a short distance to the east of the site.

The site is surrounded to the north, west and south of the site by a series of both pasture and arable farmland interspersed by a series of native and non-native woodlands.

3.1 Preliminary Ecological Appraisal

3.1.1 Scope of the Assessment

The zone of influence covers the extent of the site, the site boundaries, and areas directly adjacent to the site. The assessment considers designated sites, habitats, and species of importance for biodiversity conservation and protected species.

3.1.2 Desk Study

A desk-based review was undertaken for records of protected species and for statutory and non-statutory sites (e.g. Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSIs), and non-statutory sites (e.g. Country Wildlife Sites (CWS)) designated for wildlife conservation) within 2 km of the site.

The Government's mapping website MAGIC (www.magic.gov.uk) was also searched for Priority Habitats within 1 km of the site, statutory sites designated for nature conservation value within a 1 km radius and European designated Natura 2000 sites within 10 km.

A search was made of MAGIC for European Protected Species (EPS) licenses issued by Natural England in the surrounding area since 2009.

3.1.3 Field Survey

The field survey comprised of a walkover assessment of the areas of the site using UK Habitat Classification System methodology (UKHab 2022). This is a standard technique designed for classifying and mapping British habitats in a consistent and unified way. Each habitat was assigned the appropriate alphanumeric code followed by any relevant secondary codes in accordance with UKHab Category Definitions V1-1 (2020).

The site survey was undertaken on 6th and 7th July 2023 by Dominic Sheldon. All areas were surveyed and assessed for indicators of ecological value, including the presence of, or field signs for any protected or rare habitats and species.

3.1.4 Badger Survey

A badger survey was undertaken on the 17 October 2022 and on the 6th and 7th July 2023 by Dominic Sheldon BSc (Hons) PgCert ACIEEM TechArborA (Badger class licence holder CL36/067).

The survey involved a thorough search of the Site for evidence of badger activity based on the methodology outlined by Harris, Creswell and Jefferies (1991). A search was made for:

- Setts, including earth mounds/ spoil, evidence of bedding and runways between setts;
- Latrines, often located close to setts, at territory boundaries or adjacent to favoured feeding areas;
- Prints and paths;
- Hairs within sett entrance or caught on nearby fencing; and,
- Other evidence including snuffle holes, feeding and playing areas and scratching posts.

Where setts were observed, their status and the level of activity were noted. Sett status can be broadly classified as:

Main sett – A sett within a badger territory that appears to be the largest (usually with at least five holes) and the most well-used, with much activity in the vicinity, is categorised as the main sett. Main setts always have active badger runs leading away from them and are normally marked by latrines. Social groups have one main sett, which is the most important sett in the territory. It is used throughout the year and is the main breeding sett.

Annexe sett – Setts are categorised as annexe setts where they are assumed to form part of the main sett area but where the sett is unlikely to be directly linked by an underground passage to the main sett either due to a barrier (e.g. separated by a watercourse or ditch) or by distance. Annexe setts are normally linked to the main sett by a well-used path and lie within 150 m of a main sett entrance.

Subsidiary sett – Setts that offer an alternative sett complex to the main sett are categorised as subsidiary setts. Subsidiary setts are normally, at least, 50 m from the main sett and are not always obviously linked by a well-used path to the main sett (unlike annexe setts). Subsidiary setts often exhibit moderate levels of activity, are

larger than outlier setts but smaller than main setts. Subsidiary setts are often marked by latrines.

Outlier sett – These setts often comprise just one or two entrances. They are used infrequently and can be found at the boundaries of a badger social group's territory.

When found, activity levels at individual sett entrances were categorised using the following typology:

- **Category A:** sett entrances comprising a number of well-used sett entrances (with one or more of the following features: well-worn entrance, freshly excavated soil and bedding material);
- **Category B:** setts with partially used holes (leaves or twigs in entrance and/or mosses and other plants growing in or around the entrance); and,
- **Category C:** an apparently disused sett entrance (partially or completely blocked, with a considerable amount of excavation required for reoccupation).

Where access allowed, adjacent habitats and properties were also searched in order to assess possible impacts of the proposal in a wider context.

The survey aims were to:

- Locate all setts and badger activity within the site;
- Provide an evaluation of the likely impact of the proposed works on the badger social group and associated setts.

3.1.5 Preliminary Bat Roost Tree Inspection

The trees within the site were inspected for features that could potentially support roosting bats, consisting of natural holes, woodpecker holes, cracks/ splits, broken limbs, loose bark, hollows/cavities, and dense epicormic growth. The survey was undertaken by Dominic Sheldon on the 17th October 2022 with the trees assessed from the ground with the aid of close-focusing binoculars and a digital camera.

Trees identified with potential bat roost features were classified in accordance with the Bat Conservation Trust's *Bat Surveys for Professional Ecologists Good Practice Guidelines* 3rd Edition (Collins, 2016) as following:

- **Confirmed bat roost:** Trees with bat roosting features with the presence or further evidence of roosting bat/s;
- **High:** A 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;

- Moderate: A 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;
- Low: A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features are seen with only very limited roosting potential; and,
- Negligible: A tree with negligible habitat features that may be used by roosting bats.

3.1.6 Baseline Evaluation and Impact Assessment

Determining the importance of ecological features was undertaken in accordance with the Chartered Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM 2018). An assessment was then made of possible ecological impacts of the proposed development on each feature within the development's likely 'Zone of Influence' (Zol). Where uncertainty exists, a precautionary approach has been adopted.

3.1.7 Limitations

Care has been taken to ensure that balanced advice is provided on the information available and collected during the study period (s), and within the resources available for the project. However, the possibility of important ecological features being missed due to survey timings, absence during surveys or the year of survey cannot be ruled out. In addition, the lack of evidence or records of protected species on Site does not preclude their presence.

3.2 Phase 2 Species Surveys

3.2.1 Amphibians – Great Crested Newt HIS & eDNA Survey

Habitat Suitability Index

A review of OS maps and aerial imagery identified seven water bodies within 500m of the site boundary; comprising three off-site ponds.

An assessment of each water body's suitability to support a breeding population of great crested newts (GCN) was made according to the criteria of the Habitat Suitability

Index (HSI) (Oldham *et al.*, 2000) following the methodology described in the ARG UK Guidance Note 5 (ARG UK 2010). The scores translate into a breeding suitability as shown in Table 1.

Table 1: Scoring system for GCN breeding suitability using HSI

HSI Score	Suitability for breeding GCN
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

Environmental DNA (eDNA) Survey

Ponds identified as suitable for water collection during the HSI assessment were sampled for eDNA. This method involved taking water samples from each water body within Natural England's accepted sampling period of 15th April to 30th June following the methodology described in the Defra Report WC1067 (Biggs *et al.* 2014a) and the subsequent Technical Advice Note (Biggs *et al.* 2014b).

Twenty 30 ml water samples were taken from four of the six ponds on 28th June by Dominic Sheldon using sterile field equipment supplied by SureScreen Scientifics (for locations of ponds see Appendix 1). Sample locations were selected based on accessibility and suitable GCN egg laying and displaying areas, with as much of the margin being sampled as possible. The surveyor wore sterile gloves whilst taking the sample and did not enter the water. The water column was mixed gently before taking the sample, with care taken not to disturb the sediment at the bottom of the pond. The samples from each pond were mixed and 15 ml added to six sterile tubes containing 35 ml ethanol. Ponds containing less than 5 cm depth of water were not sampled.

Samples were stored overnight in a refrigerator and then sent to SureScreen Scientifics for analysis. The methodology for laboratory analysis can be provided by SureScreen Scientifics on request.

3.2.2 Bat Activity

The bat activity survey was undertaken in combined accordance with guidance provided by the Bat Conservation Trust's *Bat Surveys for Professional Ecologists Good Practice Guidelines* 3rd Edition (Collins, 2016).

This guidance requires that the bat activity survey consists of:

- Three manually-walked transects – one dusk transect each season (Spring, Summer, Autumn); and,
- Three periods of static automated bat detector recording with four detectors positioned for 5 consecutive nights each season (Spring, Summer, Autumn) (totaling 60 nights of recording).

Manual Bat Activity Transect Survey

The manual bat activity survey comprised of three walked transects, including:

- Dusk transects on:
 - 17th April 2023;
 - 20th June 2023; and,
 - 23rd September 2023.

Each dusk transect was walked from 15 minutes prior to sunset, until at least 2 hours after sunset. The transects were walked during relatively warm (minimum temperature: 8-15°C) and still (Beaufort Scale 0-4) weather conditions considered suitable to promote bat activity.

The transect route was prior identified during daylight hours to encompass the site, site boundaries and any features which may be utilised by dispersing or feeding bats. The transect route and results are illustrated on Appendix 2.

The transect route was continuously walked throughout the survey visits, with static positions held for at least 3 minutes when a bat was encountered to obtain behavioural information such as, whether the bat was feeding, dispersing, interacting with other bats, etc. The transect routes were walked in a counter direction for sequential survey visits.

All bat activity was recorded using a Peersonic RPA 3 bat detector (full spectrum bat detector) with internal recording capability or EM Touch (full spectrum bat detector) connected to a digital recorder. To aid species identification all recordings were analysed using Kaleidoscope Viewer (version 4.5.5) and/or, AnalookW (version 4) computer software.

Static Automated Bat Activity Survey

One automated bat detector was deployed for three recording periods, with each period consisting of five consecutive nights, as follows:

- 17th to 27th April 2023;
- 20th to 26th June 2023; and,
- 13th to 17th – September 2023.

The automated bat detector deployed was either a SongMeter2 or a SongMeter Mini (serial number: 009663 and 011401) programmed to commence recording 30 minutes prior to sunset until 30 minutes after sunrise.

The positions for the static automated bat detectors consisted of:

- Position 1: within a grove of veteran & ancient sweet chestnut trees located in the south-eastern corner of the site;
- Position 2: located on the edge of the SNAW woodland located to the west of the site;
- Position 3: located on the southern edge of the connecting plantation woodland located at the northern edge of grassland parcel G5; and,
- Position 4: Located on at the north-eastern edge of grassland parcel G4.

See Appendix 2 for illustrated positions for the static automated bat detector.

All subsequent ultrasound recordings were analysed using Kaleidoscope Viewer (version 3.1.1) and/or AnalookW (version 4) computer software.

3.2.3 Breeding Bird Survey

A breeding bird survey was undertaken in spring and summer 2023 according to an adapted British Trust for Ornithology (BTO) Breeding Bird Survey methodology (Bibby *et al*, 2000; Gilbert *et al*, 1998), consisting of a walked transect route encompassing the entire site, in suitable weather conditions (avoiding cold, windy and wet days, although showery days make acceptable survey weather). Survey dates and weather conditions are summarised in Table 2.

Table 2: Dates, times and weather conditions for breeding bird survey

Visit	Date	Surveyor	Time	Weather
1	29 th April 2023	AC & PL	06:00-08:30	14-16c, F2-3, 35-40% cc
2	13 th May 2023	ALS	05:53-08:21	10-11c, F1-3, 70-25% cc,
3	26 th May 2023	ALS	07:00-0950	10-14c, F1-3, 70-25% cc
4	21 st June 2023	ALS	08:00-10:00	17-18c, F1-3, 25-50% cc

ALS = Aby Sampson BSc ACIEEM; AC = Andrew Charles BSc (Hons) MSc MCIEEM, PL = Paul Lott

All bird species were recorded during the breeding bird survey but particular attention was paid to the presence of WCA 1981 Schedule 1 species, birds listed on the UK Red-list of Birds of Conservation Concern (BoCC; Eaton *et al.*, 2015), species listed in Section 41 of the NERC Act 2006 and Local BAP species. During the survey, information on species, their locations and behaviour was mapped and recorded.

3.2.4 Dormouse Survey

The dormouse *Muscardinus avellanarius* survey was undertaken in accord with Natural England's *Dormouse Conservation Handbook 2nd edition* (Natural England 2006). The survey was undertaken to identify whether the scrub and hedged boundaries within the proposed development area support dormice.

The dormouse survey consisted of a dormouse nesting tube survey and an autumn search for dormouse feeding remains.

A total of 100 nest tubes were installed on the 17th April 2023 at 10 m intervals within the site woodland edge habitats (see Appendix 3). The tubes were subsequently checked monthly May to September 2023 inclusive.

3.2.5 Reptile Survey

An artificial and natural refugia survey was undertaken where refugia were distributed within the site on the 26th April 2023. The refugia were subsequently checked for the presence of basking or sheltering reptiles. The artificial refugia comprised of 200 bitumen sheets, approximately 500 mm x 500 mm in size. Refugia were laid in locations deemed to have high potential for basking reptiles (see Appendix 4). Where present, any natural refugia, such as logs, stones etc, were also inspected during the survey visits for the presence of reptiles.

Once laid, the refugia were allowed to 'bed in' for a period of at least seven days, thus allowing any reptiles within the site to become accustomed to using them. Following this period, 7 survey visits were undertaken between May and July 2023 inclusive, during suitable weather conditions as detailed by Gent & Gibson (1998). The ideal weather conditions are summarised in Table 3.

Table 3: Guidelines for Reptile Surveys (Gent & Gibson 1998)

Parameter	Value
Time of year	April – September
Time of day	9:00 – 11:00*; 16:00 – 19:00*
Temperature	10 - 17°C
Sunshine	Intermittent or hazy
Wind	Little or none

* Typical timings – these may vary depending on the temperature window

3.2.6 Otter & Water Vole Survey

The survey involved a walkover of the watercourse and a survey of both river banks where accessible for a length of approximately 100 m up- and downstream of the site.

The water vole survey was undertaken in accordance with the methodology set out in the Water Vole Conservation Handbook (3rd Ed.) (Strachan, Moorhouse and Gelling, 2011) and as modified by The Water Vole Mitigation Handbook (Dean et al., 2016) and Water Vole Field Signs and Habitat Assessment (Dean, 2016).

A detailed search was made along the river following current best practice methodologies (NRA 1994, Highways Agency 1999 and Strachan *et al.* 2011) for evidence of:

- Otter, including footprints, spraints, holts, runs, slides and feeding remains; and,
- Water vole, including sightings, burrows, latrines, feeding stations, lawns, nests, footprints and runways.

The survey included both sides of the riverbank, any emergent fringe vegetation and overhanging trees/ exposed tree roots close to the water surface. During the survey, the main habitat type of each section of bank was recorded, and the locations of any evidence marked on a map and GPS device.

Table 4. Timings and environmental conditions relating to the water vole survey

Date	Temp (°C)	Wind Speed (Beaufort Scale)	Cloud Cover %	Precipitation	Humidity %
25 ^h June 2023	20	1	20	0	55
29 ^h July 2023	26	1	10	0	40
Constraints on the survey: The vegetation was particularly dense in places, meaning that full access to the back side was not possible during the July survey.					

3.2.7 Freshwater Invertebrates

The survey followed the PSYM (Predictive SYstem for Multimetrics) method (Biggs *et al.* 2000; Environment Agency and Pond Action, 2002; Williams *et al.* 1996; 1998), derived from the method developed by Pond Action (now the Freshwater Habitats Trust) for the National Pond Survey of the 1990s (Biggs *et al.* 1998), which is used by the national environmental agencies to monitor ponds and canals.

Sampling of the aquatic flora and fauna within the ponds was carried out on 12th July 2023, during a period of warm sunny weather.

First a sketch map of each pond was drawn including the positions of any inflows/outflows, vegetation and other key features. Within the outer edge (defined as the first change in bank profile along the margins) of the ponds all wetland plant species were recorded, using a combination of walking/wading the pond edge and a grapnel to sample the deeper water for possible submerged species.

Whilst undertaking the floral survey meso-habitats present within the lake were identified for invertebrate sampling. Meso-habitats can include differing areas of substrate (e.g. shallow areas of gravel or silt); vegetation cover, not necessarily each plant species present but more the type of habitat and structure they provide, e.g. floating leaved plants, tall emergent, marginal macrophytes and beds of fully submerged plants; as well as other meso-habitats such as submerged tree roots and areas of shallow marginal water grading into marsh. As a rough guide an average pond might contain three to eight meso-habitats, depending on its size and complexity (Environment Agency & Pond Action, 2002).

4.1 Desk Study

4.1.1 Statutory Designated Sites

Internationally Designated Sites

There are no internationally designated (Natura 2000) sites for nature conservation within 10 km of the Site boundary.

Nationally Designated Sites

One statutory designated site lies within 1 km of the Site boundary. A summary is provided in **Table 5**.

Non-statutory Designated Sites

There is one non-statutory site and an area of woodland identified as an Ancient Woodland Inventory (AWI) within the Site boundary for its semi-natural ancient woodland interest.

4.1.2 Non-statutory Designated Sites

Two non-designated sites for nature conversation lie within 1 km of the Site. A summary is provided in **Table 5**.

An Ancient Woodland Inventory and Ghyll Woodland were also returned from within 1 km of the Site. These are not designated sites *per se*, but are considered areas of Sussex countryside which support higher than average concentrations of existing wildlife habitats such as native woodlands, flower-rich grasslands, bogs and heathland (many of these habitats will have an international, national or local designation).

Table 5: Designated sites records within 1 km of Site boundary

Site Name	Location	Description
Statutory Designated Sites		
High Weald Area of Outstanding Natural Beauty (AONB)	Forms part of the southern site boundary	Designated as 'Weald' and given to the area between the North and South Downs which are the outer chalk rims of the ancient Wealden anticline. The sandstones and clays of the exposed centre of the dome, the 'High Weald' give rise to a hilly, broken and remote country of ridges and valleys covered by a patchwork of fields, woods and shaws. In contrast, open areas of the AONB include Ashdown Forest and, to the east, the river valleys of the Rother, Brede and Tillingham. The AONB meets the coast at Hastings. The character of the High Weald was established by the 14th century and has survived major historical events and social and technological changes. As a result the High Weald is considered to be one of the best surviving, coherent medieval landscapes in Northern Europe.
Non-statutory Sites		
The Hanger Local Wildlife Site (LWS)	Located approximately 900 m to the west	Designated for its two types of woodland that are present within a gill woodland. Alder occurs along the streams and extends up the lower slopes in parts, with oak, hazel and ash on the upper slopes and the flat ground above. The wood supports a wide range of woodland plants, mosses and liverworts, a good bird community and a number of uncommon butterflies.
Whitemans Green, Cuckfield Local geological site	Located approximately 155 m to the east of the site	Designated for its historical geological interest
Ancient Woodland Inventory Site (AWI)		
Walks Wood Ancient Woodland Inventory (AWI)	Located within the site boundary	Designated for its ancient woodland habitats
Walks Wood Ghyll Woodland	Located within the site boundary	Designated for the highly species-rich woodland, even at the small scale, support distinctive assemblages of cryptogamic plants, and are unique to south-east England.

4.1.3 EPS Mitigation Licences

No EPS mitigation licences have been granted within 1 km of the site boundary.

4.1.4 Great Crested Newt Data

Great Crested Newt Class Survey Licence Returns

No Great Crested Newt Class Survey Licence Returns have been granted within 1 km of the site boundary.

Great Crested Newt Pond Surveys 2017-2019

No ponds within 1 km of the site boundary were shown to support great crested newt from between 2017-2019.

4.1.5 Priority Habitats

The site supported a series of habitats of principal importance (HPI) or Biodiversity Action Plan (BAP) habitats. These were areas of ancient replanted woodland, ancient and semi-natural woodland and areas of the BAP habitat - wood pasture and parkland.

4.1.6 Geology & Soils

The underlying geology is very varied over the site with the following geology types being recorded:

- Ardingly Sandstone Member - Sandstone. Sedimentary bedrock formed between 139.4 and 133.9 million years ago during the Cretaceous period;
- Lower Grinstead Clay - Mudstone. Sedimentary bedrock formed between 139.4 and 133.9 million years ago during the Cretaceous period;
- Upper Grinstead Clay - Mudstone. Sedimentary bedrock formed between 139.4 and 133.9 million years ago during the Cretaceous period;
- Lower Tunbridge Wells Sand - Sandstone, siltstone and mudstone. Sedimentary bedrock formed between 139.4 and 133.9 million years ago during the Cretaceous period;
- Cuckfield Stone Bed - Sandstone, calcareous. Sedimentary bedrock formed between 139.4 and 133.9 million years ago during the Cretaceous period; and,
- Wadhurst Clay Formation - Mudstone. Sedimentary bedrock formed between 139.4 and 133.9 million years ago during the Cretaceous period.

4.2 Field Survey (UKHab and NVC).

Table 6. Environmental conditions during the field survey visits

Survey Date	Temperature (°C)	Wind Speed (Beaufort Scale)	Cloud cover (%)	Precipitation	Sunset time
17 th Oct 2022	18	3	65	0	N/A
6 th July 2023	21	2	0	0	N/A
7 th July 2023	28	2	0	0	N/A

Constraints on the survey:

The initial survey was undertaken in autumn, which may preclude spring and summer annual botanical species. However botanical diversity was considered sufficient to classify and assess the habitats present.

4.2.1 UK Habitat Classification Survey (UKHab)

The site measures approximately 109.53ha (see Appendix 2) and is located approximately 500 m to the west of the village of Cuckfield, Sussex. The site is comprised of a former historic deer park (de-parked in 1618).

The site is currently comprised of areas of dense bracken g1c, other neutral grassland g3c, *Lolium-Cynosurus* neutral grassland g3c6, modified grassland g4, wood-pasture and parkland w(26), lowland mixed deciduous woodland (also designated and Semi-natural Ancient Woodland SNAW) w1f, other broadleaved woodland w1g, dense scrub h3, ponds r1, developed land; sealed surface u1b, artificial unvegetated unsealed surface u1c and other rivers and streams r2b. Linear habitats also recorded included ecologically viable line of trees w1 (34), native hedgerow h2a6 and species-rich native hedgerow with trees h2a5 (1). A UKHab plan is provided in Appendix 1).

Modified Grassland (g4)

This habitat formed the vast majority of the grassland habitats present on site (see Figures 2-6 and Appendix 1).

This habitat was recorded in parcels G1, G1, G3, G4, G5 and G6 (refer to Appendix 2 for parcel numbers).

Species recorded included sweet vernal grass *Anthoxanthum odoratum*, perennial rye grass *Lolium perenne* being dominant with some Yorkshire fog *Holcus lanatus* and common bent *Agrostis capillaris*. Forb species recorded included rare creeping buttercup *Ranunculus repens*, thyme-leaved speedwell *Veronica serpyllifolia*, common

ragwort, broad-leaved dock *Rumex obtusifolius*, black medick *Medicago lupulina*, common field speedwell *Veronica persica*, dove's-foot cranesbill *Geranium molle*, white clover *Trifolium repens* and curled dock *Rumex crispus*, selfheal *Prunella vulgaris*, curled dock *Rumex crispus*, dove's-foot cranesbill and common hogweed *Heracleum sphondylium*.

Overall species diversity was below 8sp per m² and a such was classified as G4.

Secondary codes recorded within this habitat type included cattle grazed (101), mown and collected (107).

Secondary codes relating to the wood pasture and parkland (26), scattered trees (32), ancient tree (205) and mature tree (203) – are discussed in more detail below.



Figure 2: View of the grassland sports pitches, located within grassland Parcel G2 (see Appendix 1).



Figure 3: View of the improved grassland located within grassland Parcel G2.



Figure 4: View of the improved grassland located within grassland Parcel G3



Figure 5: View of the improved grassland located within grassland Parcel G4, located to the south of the site within the former parkland.



Figure 6: View of the improved grassland located within grassland Parcel G5, located to the south of the site within the former parkland.

Wood pasture and Parkland (26), scattered trees (32), mature tree (203) and ancient tree (205)

Being a parkland habitat, a series of parkland trees are located within the site. The older mature and over-mature specimens were pedunculate oak. A number of these were located to the north and west of grassland Parcel G4 and west of grassland Parcel G5 (see Figures 7-12). A number of these supported features that had a high potential to support roosting bats (see section 4.5.1).

Veteran & Ancient Trees

The site supported a small number of veteran trees. This included a veteran oak located within the plantation woodland located along the centre of the site (see Appendix 1 & 6). A veteran beech located along the southern edge of grassland Parcel G5 (see Figure 14) and two clumps of veteran (and ancient) sweet chestnuts located within grassland Parcel G5 (see Figures 14-19, Appendix 1 & 6).

The veteran sweet chestnuts were of particular note and were considered to be outstanding examples of their type supporting all of the classic veteran features including, rot holes, tear-outs, snags, delaminated wood on branches, fallen deadwood accumulations, standing deadwood, woodpecker holes, fungal bodies, basal cavities, cracks, splits and crown borne deadwood. In some cases, these trees included vigorous epicormic growth. As such these trees can be considered to be both veteran and ancient trees. These trees had been planted in clumps of six and (further to the east) a clump of three.



Figure 7: View of the parkland tree located to the north of grassland Parcel G4.



Figure 8: View of a parkland tree located to the west of grassland Parcel G4.



Figure 9: View of a parkland tree located within grassland Parcel G5.



Figure 10: View of the dense bracken located on the northern edge of grassland Parcel G3



Figure 11: View of a mature parkland beech tree located within grassland Parcel G5



Figure 12: View of a clump of mature parkland trees located within grassland Parcel G5



Figure 13: View of the veteran pedunculate oak located within the central woodland.



Figure 14: View of the veteran beech located towards the south of the site complete with tear-out feature.



Figure 15: View of clump of veteran and ancient sweet chestnut trees located within grassland Parcel G5



Figure 16: View of one of the sweet chestnut stems located at grassland Parcel G5 showing some epicormic growth.



Figure 17: View of a deadwood accumulation within the clump located at grassland Parcel G5



Figure 18: View of one of the outstanding veteran and ancient sweet chestnut trees located within grassland Parcel G5



Figure 19: View of the same tree with human for scale showing a multitude of veteran and faunal features.

Other Neutral Grassland q3c

This habitat was confined to the modified grassland verges and small areas located to the south-west of Parcel G5 (see Figure 20). Species recorded included common bent, Yorkshire fog and cock's foot. Forb species included common sorrel *Rumex acetosa*, common field speedwell *Veronica persica*, soft rush *Juncus effusus*, meadow cranesbill *Geranium pratense*, tufted vetch *Vicia cracca*, white clover, field horsetail *Equisetum arvense*, broad-leaved dock, creeping buttercup and dandelion *Taraxacum officinale* agg.



Figure 20: View of the semi-improved grassland (interspersed with developing woody scrub 10) located adjacent to grassland Parcel G5.

Overall species diversity was above 8 spp. per m² and along with the species composition the habitat was classified as G3c.

Secondary codes recorded within this habitat type included scattered scrub (10), unmanaged (512), tall or tussocky sward (128), abandoned (519) and for the field margins – neglected (518).

Lolium-Cynosurus Neutral grassland q3c6

To the far south of the site, within grassland Parcel G6 lay an area dominated by *Lolium-Cynosurus* Neutral grassland (see Figure 21). Species recorded included sweet vernal grass, Yorkshire fog, common bent, perennial rye grass, and cock's foot. Forb species recorded included white clover, creeping buttercup, meadow buttercup

Ranunculus acris, common sorrel, creeping thistle *Cirsium arvense*, bird's-foot trefoil *Lotus corniculatus*, meadow cranesbill *Geranium pratense* and common ragwort.

Overall species diversity was above 8sp per m² and along with the species and forb cover/composition the habitat was classified as G3c6.

Secondary codes recorded within this habitat type included unmanaged (512), tall or tussocky sward (128) at the time of survey.



Figure 21: View of the semi-improved grassland located within Parcel G6.

Lowland Mixed Deciduous Woodland w1f

This habitat was located along the western part of the site (see Figures 22 & 23). The woodland itself was fairly diverse with pedunculate oak, ash (with advanced ADB), field maple *Acer campestre*, hazel *Corylus avellana* dominated understorey subject to some planting with beech (some of which has been previously coppiced), sycamore *Acer pseudoplatanus*, sweet chestnut, horse chestnut *Aesculus hippocastanum* and spindle *Euonymus europaeus*. The ground flora comprised occasional hard fern *Blechnum spicant*, wood sorrel *Oxalis acetosella*, pendulous sedge *Carex pendula*, thin-spiked wood sedge *Carex strigosa*, stinging iris *Iris foetidissima*, betony *Betonica officinalis*, ivy *Hedra helix*, dog rose *Rosa canina*, sanicle *Sanicula europaea*, bramble *Rubus fruticosus* agg, bush vetch *Vicia sepium*, wood sage *Teucrium scorodonia*, hemp

agrimony *Eupatorium cannabinum*, tormentil *Potentilla erecta*, water mint *Mentha aquatica*, tufted hairgrass *Deschampsia cespitosa* and bracken *Pteridium aquilinum*.

Throughout the southern part of the woodland, in close proximity to the established pathways there are extensive blocks of the invasive species *Rhododendron ponticum* (as listed on Schedule 9 of the wildlife and Countryside Act 1981). This has been subject to some form of management over the previous 10 years. The woodland was subject to relatively high browsing and grazing pressure from deer, predominantly fallow *Dama dama*, which was recorded during the site visit.



Figure 22: View of the semi-natural woodland showing the relatively open ground layer subject to deer grazing and browsing pressure.



Figure 23: View of the invasive *Rhododendron ponticum* recorded throughout the woodland.

Other Cereal Crops C1c7

This habitat can be confined to an area contained by grassland Parcel G4 (see Figure 24 & Appendix 1). The arable comprised *Sorghum* sp with some *Triticale* sp. The crop has been sown to provide cover and a drive location for pheasants *Phasianus colchicus* being raised within the woodland located directly to the south. The secondary code for this habitat is 609 – cover crop.



Figure 24: View of the arable habitat located on site.

Other Broadleaved Woodland w1a

This habitat was located along the majority of the western, central and part of the southern site boundaries (see Appendix 1). From studying historical aerial photographs, the western and central broadleaved plantation woodland was of more recent origin being planted in the late 1990s, while the plantation woodland located along part of the southern site boundary was probably planted in the late 1970/80s. All these areas were comprised of grassland prior to these plantings taking place. These are discussed in more detail below.

Western Plantation Woodland

This semi-mature woodland has been planted on a grid pattern from pedunculate oak *Quercus robur*, sweet chestnut *Castanea sativa*, ash *Fraxinus excelsior*, silver birch *Betula pendula*, willow *Salix* sp, cherry *Prunus avium*, a single specimen of *Cotoneaster* sp. and a proportion of poplar *Populus* sp (see Figure 25). The ground flora was generally sparse, species-poor and denuded with ground ivy *Glechoma hederacea*, pendulous sedge, common nettle, male fern, light scattered bramble, occasional dog's mercury *Mercurialis perennis* and ground elder *Aegopodium podagraria* with large amounts of bare ground. A large number of earthball fungi *Scleroderma citrinum*, sulphur tuft *Hypholoma fasciculare* and patches of common haircap *Polytrichum commune* were recorded within this woodland.

The woodland also supported a number of rides (see Figure 26), presumable to provide vehicular access. These rides supported an identical species composition to the rest of the plantation woodland ground flora located within this area, with the addition of marsh thistle *Cirsium palustre*, creeping buttercup *Ranunculus repens*, lesser celandine *Ficaria verna*, thin-spiked wood sedge *Carex strigosa* and common bent *Agrostis capillaris*.



Figure 25: View of the broadleaved plantation woodland



Figure 26: View of one of the rides located within the plantation woodland

Southern Plantation Woodland

This woodland was comprised of ash with some Poplar species and a limited understorey of scattered hazel (see Figure 27 below). The ground flora was more varied with pendulous sedge, false brome *Brachypodium sylvaticum*, bramble, dense ivy, male fern *Dryopteris filix-mas* and common nettle. The vast majority of the ash had or was in the process of dying from ash die back *Hymenoscyphus fraxineus*. Some self-sown alder *Alnus glutinosa* was located along the watercourse.



Figure 27: View of the southern plantation woodland showing advanced ash die back related death of trees.

Central Plantation Woodland

This woodland was comprised of predominantly turkey oak *Quercus cerris* with silver birch, ash, pedunculate oak, poplar sp.

Dense Scrub h3

This habitat was confined to small areas located within grassland Parcel G5 (see Figure 28). Species recorded included bramble *Rubus fruticosus*, blackthorn *Prunus spinosa* and hawthorn *Crataegus monogyna*.



Figure 28: View of the dense scrub located within grassland Parcel G5.

Dense bracken q1c

This habitat was confined to the grassland edges and located on the northern edge of field parcel G4 and in small areas throughout grassland parcels G2, G4 & G5 (see Figures 29-32 Appendix 1). Species recorded included dominant bracken *Pteridium aquilinum*.

Ponds r1

Six ponds are located within the site. Two of these are former quarry sites of some antiquity located within the semi-natural ancient woodland component of the site (see Figure 33 for northernmost pond). Both of these ponds receive large leaf fall from surrounding trees and are generally heavily shaded. Floating species are restricted to duck weed *Lemna minor* and a few marginal species such as soft rush.

The next two ponds are located within grassland Parcel G5. Both of these ponds were fenced off from the surrounding grassland and surrounded by dense woody scrub and semi-mature trees (see Figures 34 & 35 respectively).



Figure 29: View of the dense bracken located to the north of grassland Parcel G2



Figure 30: View of the dense bracken located to the centre of grassland Parcel G4.



Figure 31: View of the dense bracken located to the centre of grassland Parcel G5



Figure 32: View of the dense bracken located on the northern edge of grassland Parcel G6



Figure 33: View of the northernmost pond surrounded by dense woodland.



Figure 34: View of the pond located within the SNAW.



Figure 35: View of the other pond located within grassland Parcel G5.

The final two ponds are associated with a coarse fishing club located towards the south-western part of the site. Due to presence of presumed carp, the water quality within these ponds is very poor with significant turbidity and a lack of general floating plant species bar a single specimen of white water lily *Nymphaea alba* (see Figures 36 & 37 respectively).

These ponds are fed by a natural spring located just to the north of the two ponds, while a piped outflow taking excess water flows to the south underneath the south-western access track directly into a watercourse that flows from the west to the east through the southernmost part of the site. This causes significant water clarity issues relating to suspended sediment and presumably nitrate impacts to the watercourse (see Section 5.3.4).



Figure 36: View of one of the coarse fishing ponds



Figure 37: View of the other coarse fishing pond showing high levels of sediment loading.

Other rivers and streams r2b

A watercourse runs from the west to the east along the southern part of the site (see Figures 38 & 39). This watercourse is semi-natural in nature and has carved a meandering watercourse with relatively steep sides through the broadleaved and semi-natural woodland located within this area. Due to the topography, this area is likely prone to occasional flooding.

As mentioned previously, the water quality is very poor within the site due to the impact from the coarse fishing outflow pipe located at TQ 28897 24268.



Figure 38: View of the watercourse located along the southern site boundary.



Figure 39: View of the same watercourse showing the high levels of sediment loading.

Developed land, sealed surface u1b

This habitat type was confined to the exposed surface of a concrete underground fuel storage facility located at the northern end of grassland parcel G4.

Artificial unvegetated unsealed surface u1c

This habitat was confined to the edges of the edges of the area of gravel/hardstanding parking provision located to the north of grassland Parcel G1 (see Figure 40). Species recorded included daisy *Bellis perennis*, annul meadow grass *Poa annua*, dandelion, scattered individual plants of perennial rye grass, wood avens *Geum urbanum*, dove's-foot cranesbill, white clover and patches of white English stonecrop *Sedum anglicum*.



Figure 40: View of the Artificial unvegetated unsealed surface habitat located on site.

Hedgerows

Native hedgerows were recorded throughout the northern part of the site (see Figures 41–44 & Appendix 1). The parkland areas of the site lacked hedgerows. The hedgerows varied from being of some antiquity to being of more recent origin (the southern, eastern and northern boundaries of grassland Parcels G1 & G2) and varied in terms of management from annual flailing to no apparent management. These are dealt with in more detail below:

Native hedgerow h2a6

These hedgerows were confined to the northern and eastern boundaries of grassland Parcel G1 and the northern and eastern boundaries of grassland Parcel G2. Species recorded included hazel (the general dominant species) with sycamore, hawthorn, ash (with ADB), dog rose, field elm *Ulmus minor*, bramble and blackthorn. Of these, only the northern hedgerow of grassland Parcel G1 was managed in any way, utilising mechanical flail on an annual basis. Of these, the western boundary of grassland Parcel G1 supported trees including a series of mature oak and ash trees.

Species-rich native hedgerow with trees h2a5

These hedgerows were generally unmanaged and had grown tall and bushy (approx. 6m tall x 5 m wide). From studying aerial photographs, these hedgerows date from the time that the broadleaved plantation woodland was planted (circa 1990s). Species were varied with hazel (dominant) with goat willow *Salix caprea*, sycamore, blackthorn, dog rose, field maple *Acer campestre*, hawthorn, dog rose, field elm, rowan *Sorbus*

aucuparia, bramble, grey willow *Salix cinerea*, elder *Sambucus nigra*, ash (with ADB), spindle *Euonymus europaeus*, guelder rose *Viburnum opulus* and holly *Ilex aquifolium*.



Figure 41: View of the northern hedgerows of grassland Parcel G1



Figure 42: View of the eastern hedgerows of grassland Parcel G1



Figure 43: View of the south-western hedgerow of grassland Parcel G2



Figure 44: View of the north-eastern hedgerow of grassland Parcel G2

4.3 Amphibians

The woodland edges, dense scrub edge, hedgerow bases and ponds on site are likely to provide both terrestrial and aquatic breeding habitat for amphibian species, such as common frog *Rana temporaria*, common toad *Bufo bufo*, and palmate newt *Lissotriton helveticus*.

Records for great crested newt have been recorded within the locality and this species is known to be present within the locality. There are a number of ponds located within the site boundary and these were all subject to further survey in the form of Habitat Suitability Index (HSI) and, if required eDNA surveys.

4.3.1 Great Crested Newt Habitat Suitability Index (HSI)

An assessment of each water body's suitability to support a breeding population of great crested newts (GCN) was made according to the criteria of the Habitat Suitability Index (HSI – see Table 4) (Oldham *et al.*, 2000) following the methodology described in the ARG UK Guidance Note 5 (ARG UK 2010). The scores translate into a breeding suitability as shown in Table 7.

4.3.2 Environmental DNA (eDNA)

Ponds A, B, C & D were identified as suitable for water collection during the HSI assessment were the sampled for eDNA. This method involved taking water samples from each water body within Natural England's accepted sampling period of 15th April to 30th June following the methodology described in the Defra Report WC1067 (Biggs *et al.* 2014a) and the subsequent Technical Advice Note (Biggs *et al.* 2014b).

Twenty 30ml water samples were taken from each pond on the 18th April 2023 by Dominic Sheldon and Paul Lott, using sterile field equipment supplied by Applied Genomics. Sample locations were selected based on accessibility and suitable GCN egg laying and displaying areas in combination with the proposed impacts of the restoration works, with as much of the margin being sampled as possible. The surveyor wore sterile gloves whilst taking the sample and did not enter the water. The water column was mixed gently before taking the sample, with care taken not to disturb the sediment at the bottom of the pond. The samples from each pond were mixed and 15 ml added to six sterile tubes containing 35ml ethanol. Ponds containing less than 5cm depth of water were not sampled.

Samples were stored overnight in a refrigerator and then sent to Applied Genomics for analysis. The methodology for laboratory analysis can be provided by Applied Genomics on request.

The results indicate that the site is of **site Importance** to great crested newt with a positive result on likely breeding within one pond on site. This species is likely located throughout the site during its terrestrial phase.

Table 7: Habitat Suitability Index and eDNA Results

Pond No.	Location (OS grid ref)	HSI score	Pond suitability	eDNA survey (Y/N)	eDNA result
1	TQ 29489 25286	0.7963	Excellent	Y	Negative
2	TQ 29018 24372	0.5993	Average	Y	Negative
3	TQ 289632 4392	0.3863	Poor	Y	Negative
4	TQ 292342 4536	0.7885	Good	Y	Positive
5	TQ 28926 24391	0.3378	Poor	N	N/A
6	TQ 28901 24308	0.3324	Poor	N	N/A

Ponds 1-4 were subject to an eDNA survey, of which pond 4 returned positive for GCN eDNA. As such, great crested newt are considered present within the terrestrial habitat on site. Refer to **Appendix 1** for pond locations.

4.4 Badger

[REDACTED]

[REDACTED]

[REDACTED]

4.5 Bats

Numerous records for commuting or foraging bats were returned from the data search from SBRC from within 1 km of the site.

This included records for brown long-eared bat *Plecotus auritus*, unidentified long-eared species *Plecotus* sp., soprano pipistrelle *Pipistrellus pygmaeus*, common pipistrelle *Pipistrellus pipistrellus*, unidentified pipistrelle *Pipistrellus* species, Nathusius's pipistrelle *Pipistrellus nathusii*, Noctule *Nyctalus noctula*, Whiskered bat *Myotis mystacinus*, Brandt's bat *Myotis brandtii*, unidentified *Myotis* sp., serotine *Eptesicus serotinus* and unidentified bat *Chiroptera* species.

On consulting aerial photographs, it is most likely that bats using the local area utilise the flanking woodlands within the site to travel from east to west and from north to south along these strong linear features supporting the commuting of bat species and allowing the access of further foraging grounds/ habitats within the surrounding landscape through the use of other commuting features such as hedgerows, hedgerow trees and woodlands. The veteran (and ancient) sweet chestnut trees within the site are likely to be of interest due to the rich habitats (and therefore likely diverse and abundant invertebrate prey) they provide.

As the main body of the site contains foraging habitat for bats and the site is considered to be of importance for foraging bat species, including noctule, particularly during May – July, when cockchafer beetles *Melolontha* sp. are on the wing.

However, there is an abundance of high quality foraging habitat in the local area comprising woodlands, woodland edge habitats with smaller areas of good-quality semi-improved grassland and river corridors and as such, the importance of the site for foraging bat species is not considered important above the local level.

4.5.1 Roosting Bats

Numerous roost records were returned by SBRC including a single maternity roosts for brown long-eared *Plecotus auratus* and records for general summer roosting for brown long-eared bat *Plecotus auritus*, unidentified long-eared species *Plecotus* sp., soprano pipistrelle *Pipistrellus pygmaeus*, common pipistrelle *Pipistrellus pipistrellus*, unidentified pipistrelle *Pipistrellus* species, Noctule *Nyctalus noctula*, natterer's bat *Myotis nattereri*, unidentified *Myotis* sp., serotine *Eptesicus serotinus* and unidentified bat *Chiroptera* species within 2 km of the site.

Trees

No bat roosts were found within trees on Site although a number of trees on site presented potential roosting features (PRFs) that had a moderate to high bat roosting potential. These are discussed in more detail in **Table 8** below:

Table 8: PRFs within Site trees (refer to Appendix 1).

Picture	Description	Potential Roosting Feature category
	Bark flake – Appendix 1	Low
	Woodpecker hole (WPH) – Appendix 1	Low-moderate
	Woodpecker hole – Appendix 1	High

Picture	Description	Potential Roosting Feature category
	Rams horns feature – Appendix 1	Low-moderate
	Multiple features present on veteran ancient sweet chestnut trees – Appendix 1	High
	Impact shatter and rot features – Appendix 1	Moderate - high

Picture	Description	Potential Roosting Feature category
	Woodpecker hole – Appendix 1	High
	Woodpecker hole – Appendix 1	High

Building

The only building located on site supported a large number of features that have the potential to support roosting bats. Gaps under ridge and roof tiles were recorded along with access gaps into the two (locked) rooms within the building providing access into dark areas including access to the ridge beam. As stated earlier, access into the two rooms of the building were not possible so a full assessment could not be undertaken.

A single degraded bat dropping was recorded lying on the edge of the southern facing open area within the building (see Figure 45 below).

It is considered highly likely that the building supports unknown numbers of roosting crevice dwelling bat species including both day and night roosting. The presence of 'breathable membrane' under the ceramic tiles of this building is cause of significant concern as this has been shown to actively entrap and kill bats that come into contact with it.

Within the context of the local area and bearing in mind the presence of numerous roosts for the species recorded from SBRC, the site is considered to be of no more than **Parish Importance** for roosting bats.



Figure 45: View of the same tree with human for scale showing a multitude of veteran and faunal features.

4.5.2 Bat Activity Survey

Manual Bat Activity Transect Survey

The manual bat activity survey identified a moderate level of bat activity for a moderate diversity of bat species, predominately formed by common pipistrelle, with occasional passes from soprano pipistrelle, common pipistrelle, noctule, serotine, and bats from the *Myotis* and *Plecotus* genus.

The activity predominantly comprised of bats recorded along the woodland edges with more limited activity within the central portions of the site as would be expected with reduced commuting habitat present. The site boundaries provide sheltered feeding habitat and sheltered flight lines for bat species.

Survey dates and subsequent weather conditions experienced during the manual bat activity surveys are provided in Table 9.

The manual bat activity survey results are quantified in Table 9, with the cumulative distribution and frequency of the results indicated in Figure 10 (a cumulative survey map for all of the manual bat activity survey visit are presented in Appendix 2).

Table 9. Manual bat activity survey transect dates, timings and weather conditions.

		Temp (°C)	Wind Speed (Beaufort Scale)	Cloud Cover %	Precipitation
17th April 2023 Sunset: 19:59 Start Time: 19:55 End Time: 21:55	Start of Survey	16	1	10	None
	End of Survey	15	0	0	None
20th June 2023 Sunset: 21:18 Start Time: 21:03 End Time: 23:18	Start of Survey	16	0-1	15	None
	End of Survey	15	0	25	None
23rd Sept 2023 Sunset: 18:58 Start Time: 18:43 End Time: 21:45	Start of Survey	13	1	15	None
	End of Survey	12	1	5	None

Table 10. Summary of bat activity recorded during the manual bat activity transect surveys

surveys

Species Detected	Number of Bat Passes/Encounters				
	Visit 1	Visit 2	Visit 3	Species Total	Activity Identified
	17 th April 2023	20 th June 2023	23 rd Sept 2023		
Common pipistrelle	11	16	6	<u>33</u>	Foraging; social
Noctule	2	0	0	<u>2</u>	
Soprano pipistrelle	10	11	12	<u>33</u>	Foraging; social
Long eared species	3	0	0	<u>3</u>	
Serotine	1	0	1	<u>2</u>	Foraging
Myotis species	1	1	2	<u>4</u>	Foraging
Total (all bats)	28	28	21	<u>77</u>	

Automated Bat Activity Survey

The automated bat detector survey comprised of four automated bat detectors, deployed for the following periods (See Appendix 2 for static automated bat detector positions):

- 17th to 27^h April 2023;
- 20th to 26^h June 2023; and,
- 13th to 17^h – September 2023.

See Tables 11-14 for a summary of recorded bat activity for each recording location.

Due to the species recorded, the site location, habitat connectivity to large areas of semi-natural woodland and the diverse semi-natural habitats present, the site is considered to be of **parish importance** for commuting bat species.

The static automated bat detector recorded a moderate level of bat activity, including a high diversity of bat species, including at least 14(15) species recorded. Of note is the possible Alcaholic bat *Myotis Alcaholic* recorded during the bat automated surveys.

Table 11: Combined Automated Bat Passes – Location A.

Location A	19th to 23rd April 2023	21 st - 25th June 2023	13 th -17 th Sept 2023	Total
Alcaholic	-	-	-	0
Barbastelle	-	-	1	1
Bechstein's bat	-	-	-	0
Brandt's bat	-	3	-	3
Common Pipistrelle	447	670	476	1593
Daubenton's bat	7	3	20	30
Greater Horseshoe bat	-	-	-	0
Lesser Horseshoe bat	-	-	-	0
Leisler's bat	-	1	-	1
Long-Eared bat	-	2	-	2
Nathusius Pipistrelle	-	2	4	6
Natterer's	2	-	-	2
Noctule	-	4	-	4
No ID Myotis	-	4	2	6
Serotine	-	43	-	43
Soprano Pipistrelle	261	332	19	615
Whiskered Bat	-	-	7	7
			Total	1313

Table 12: Combined Automated Bat Passes – Location B.

Location A	19th to 23rd April 2023	21 st - 25th June 2023	13 th -17 th Sept 2023	Total
Alcathoe	-	2	-	2
Barbastelle	-	-	37	37
Bechstein's bat	-	-	-	0
Brandt's bat	-	7	-	7
Common Pipistrelle	77	719	8456	9252
Daubenton's bat	3	1	2785	2789
Greater Horseshoe bat	-	-	-	0
Lesser Horseshoe bat	-	-	-	0
Leisler's bat	-	-	-	0
Long-Eared bat	-	-	11	11
Nathusius Pipistrelle	-	11	4	15
Natterer's	-	-	95	95
Noctule	-	-	14	14
No ID Myotis	-	2	630	632
Serotine	-	2	-	2
Soprano Pipistrelle	134	195	2549	2878
Whiskered Bat	-	-	1244	1244
			Total	16980

Table 13: Combined Automated Bat Passes – Location C.

Location A	19th to 23rd April 2023	21 st - 25th June 2023	13 th -17 th Sept 2023	Total
Alcathoe	-	-	-	-
Barbastelle	2	-	6	8
Bechstein's bat	-	-	-	0
Brandt's bat	1	-	-	1
Common Pipistrelle	35	235	181	451
Daubenton's bat	12	6	22	40
Greater Horseshoe bat	-	-	-	0
Lesser Horseshoe bat	-	-	-	0
Leisler's bat	-	-	2	2
Long-Eared bat	-	-	33	33
Nathusius Pipistrelle	-	4	4	8
Natterer's	6	3	3	6
Noctule	-	6	8	14
No ID Myotis	-	-	40	40
Serotine	-	-	-	0
Soprano Pipistrelle	10	29	80	119
Whiskered Bat	1	-	2	2
			Total	724

Table 14: Combined Automated Bat Passes – Location D.

Location A	19th to 23rd April 2023	21 st - 25th June 2023	13 th -17 th Sept 2023	Total
Alcathoe	-	-	-	0
Barbastelle	-	-	2	2
Bechstein's bat	-	-	-	0
Brandt's bat	-	-	-	0
Common Pipistrelle	60	10	29	99
Daubenton's bat	2	1	2	5
Greater Horseshoe bat	-	-	-	0
Lesser Horseshoe bat	-	-	-	0
Leisler's bat	-	-	-	0
Long-Eared bat	-	-	2	2
Nathusius Pipistrelle	2	-	2	4
Natterer's	1	1	1	3
Noctule	1	7	-	8
No ID Myotis	-	-	-	0
Serotine	-	2	-	2
Soprano Pipistrelle	31	2	19	52
Whiskered Bat	-	-	1	1
			Total	178

4.6 Dormice

The dense scrub, hedgerows and woodland on site provide suitable habitat to support dormice.

Thirteen records were returned by SBRC within 1 km of the site within connecting habitat (nearest location approximately 200 m east of the site). Owing to the number of records, the good connectivity of the habitat within the local landscape in the form of large areas of woodland types and native hedgerows, their presence on site was considered likely.

A total of 100 dormouse nesting tubes were installed on the 18th April 2023 at 20 m intervals within the site boundaries (see Appendix 4 for locations and results).

The tubes were subsequently checked monthly from June to September 2023 (see Table 15 below).

Two dormouse nests were identified on two separate visits in June to October.

The site is considered to be of **Local Importance** for dormouse.

Table 15. Dormouse nesting tube survey results

Dormouse nesting tube locations	Field Signs of Dormouse Use				
	18 th April 2023	20 th June 2023	29 st July 2023	15 th Aug 2023	13 th Sept 2023
Perimeter of survey area	Setup	None	X2 nests recorded	None	X2 nests recorded

4.7 Hedgehog

The scrub, woodland, and hedges will provide shelter and foraging resources for hedgehog.

4.8 Birds

The scrub, hedges and trees provide foraging and nesting opportunities for birds.

However, a total of 37 bird species were recorded, including 27 bird species which are considered to breed within or in the immediate surroundings of the site. See Table 16 for a list of species recorded.

Of the species recorded, four are considered to be of high (red-listed) conservation status under the Birds of Conservation Concern 4: willow tit *Poecile montanus*, marsh tit *Poecile palustris*, skylark *Alauda arvensis*, song thrush *Turdus philomelos*, redwing *Turdus iliacus*, mistle thrush *Turdus viscivorus* and grey wagtail *Motacilla cinerea*. [underlined species considered as breeding within the site].

Three species were recorded which are considered to be of medium (amber-listed) conservation status: dunnock *Prunella modularis*, kingfisher *Alcedo atthis* and meadow pipit *Anthus pratensis*, skylark *Alauda arvensis* and tawny owl *Strix aluco* [underlined species considered as breeding within the site].

Combined survey visit maps are provided in Appendix 6. Survey timings and weather conditions are presented in Table 17 below.

Table 16: Bird species recorded during any of the survey visits

Bird Species	Latin	Breeding	Status
Barn owl	<i>Tyto alba</i>		
Blackbird	<i>Turdus merula</i>	✓	
Blackcap	<i>Sylvia atricapilla</i>	✓	
Blue Tit	<i>Cyanistes caeruleus</i>	✓	
Buzzard	<i>Buteo buteo</i>	✓	
Carrion Crow	<i>Corvus corone</i>		
Chaffinch	<i>Fringilla coelebs</i>	✓	
Chiffchaff	<i>Phylloscopus collybita</i>	✓	
Coal Tit	<i>Parus ater</i>		
Dunnock	<i>Prunella modularis</i>	✓	Amber
Wood pigeon	<i>Columba palumbus</i>	✓	
Goldcrest	<i>Regulus regulus</i>	✓	
Goldfinch	<i>Carduelis carduelis</i>	✓	
Great Tit	<i>Parus major</i>	✓	
Greater spotted woodpecker	<i>Dendrocopos major</i>	✓	
Green Woodpecker	<i>Picus viridis</i>	✓	
Greenfinch	<i>Chloris chloris</i>	✓	
Grey wagtail	<i>Motacilla cinerea</i>		Red
Jackdaw	<i>Corvus monedula</i>		
Kingfisher	<i>Alcedo atthis</i>		Amber
Magpie	<i>Pica pica</i>	✓	
Marsh tit	<i>Poecile palustris</i>	✓	Red
Meadow Pipit	<i>Anthus pratensis</i>	✓	Amber
Mistle thrush	<i>Turdus viscivorus</i>		Red
Nuthatch	<i>Sitta europaea</i>	✓	
Pheasant	<i>Phasianus colchicus</i>	✓	
Pied wagtail	<i>Motacilla alba</i>		
Redwing	<i>Turdus iliacus</i>		Red
Robin	<i>Erithacus rubecula</i>	✓	
Skylark	<i>Alauda arvensis</i>	✓	Amber
Song Thrush	<i>Turdus philomelos</i>	✓	Red
Swallow	<i>Hirundo rustica</i>		
Tawny owl	<i>Strix aluco</i>	✓	Amber
Tree creeper	<i>Certhia familiaris</i>	✓	
Willow tit	<i>Poecile montanus</i>	✓	Red
Wood Pigeon	<i>Columba palumbus</i>	✓	
Wren	<i>Troglodytes troglodytes</i>	✓	

Table 17. Breeding bird survey dates, timings, and weather conditions

Date & Times	Start/End	Temp (°C)	Wind Speed (Beaufort Scale)	Cloud Cover %	Precipitation
29 th April 2023	Start of Survey	14	2	35	0
Start Time: 06:00 End Time: 08:30	End of Survey	16	3	40	0
13 th May 2023	Start of Survey	10	4	90	0
Start Time: 05:53 End Time: 08:21	End of Survey	11	5	95	0
26 th May 2023	Start of Survey	10	1	70	0
Start Time: 07:00 End Time: 9:50	End of Survey	14	3	25	0
21 st June 2023	Start of Survey	17	1-2	25	0
Start Time: 8:00 End Time: 10:00	End of Survey	18	2-3	50	0

4.9 Reptiles

The dense scrub, field parcel verges, woodland edge and hedgerow base provide suitable habitat for common reptile species such as slow worm *Anguis fragilis*, common lizard *Zootoca vivipara* and grass snake *Natrix natrix*.

Reptile survey

The artificial reptile refugia were laid on the 17th April 2023, with 200 refugia set out on site and allowed to 'bed in' for a period of seven days (see Appendix 4). Following the setting up of refugia, a further 7 visits were undertaken in total during May & June 2023. The weather conditions and results of the survey visits are presented in Table 18 below.

The reptile survey identified a 'good' population of slow worm (Froglife, 1999) and a 'good' population of glass snake.

Table 18: Results of the reptile survey

Visit	Date and Time	Environmental conditions		Reptiles
1	3 rd May 2023 08:00	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	10 35 2	X2 grass snake (juv), X2 adult female slow worm, X1 male slow worm X2 juv slow worm
2	13 th May 2023 08:00	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	10 50 3	Slow worm: 1 x Adult male, x1 adult female, x2 juv grass snake.
2	25 th May 2023 16:15	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	17 15 3	X1 adult grass snake, x1 sub-adult grass snake, x4 juv grass snake, x1 adult female slow worm, x2 subadult slow worm, x2 juvenile slow worm.
3	20 th June 2023 16:15	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	18 15 2	X1 adult grass snake, x2 juv grass snake, x2 adult female slow worm, x2 adult male slow worm, x2 juv slow worm
4	25 th June 2023 16:15	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	28 25 3	X1 adult grass snake, x5 juv grass snake, x1 male slow worm, x1 female slow worm
5	6 ^h July 2023 16:00	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	20 0 1	Slow worm: x1 female. Grass snake: x1 juvenile and x1 adult.
6	7 ^h July 2023 08:30	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	22 65 3	X1 adult grass snake, x1 juv grass snake, x1 adult female slow worm
7	29 th July 2023 10:30	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	20 50 1	X6 adult grass snake, x1 juv grass snake, x2 shed grass snake skins.

4.10 Non-native Invasive Botanical Species

Rhododendron ponticum and least duckweed *Lemna minuta*, both listed on Schedule 9 of the Wildlife and Countryside Act 1981 as a non-native invasive species, were present on site.

Winter heliotrope *Petasites pyrenaicus* was found to be present at the south-western extent of the site, whilst not listed under the Wildlife & Countryside Act, Schedule 9, this is also a non-native invasive species and should be removed from the site.

4.11 Aquatic Invertebrates

Sampling of the aquatic flora and fauna within the ponds was carried out on 12th July 2023, during a period of warm sunny weather. The previous June and late May had seen a prolonged period of warm weather and low rainfall, such that the various watercourses noted on the habitat map had been dry for some time.

Upon visiting the plotted location of Pond 3, this was revealed to be a basin at the edge of woodland that was densely overgrown with brambles *Rubus fruticosus* agg. and other ruderal vegetation, with trees rooted in the basin and no evidence of standing water. Unlike the other three ponds within the site, no pond is marked at this location on earlier Ordnance Survey maps of the area, suggesting that this is instead an ephemeral waterbody at best that occasionally fills with run-off from the adjacent field following heavy rain; thus, only ponds 1, 2 and 4 were subsequently surveyed.

The lists of aquatic invertebrate taxa recorded from the ponds are presented in Table 19. Table 19 contains the environmental parameters, plant species lists, PSYM metrics and CCI values.

Pond 1

This pond is considered likely to have been a former stock watering pond as it is a relatively small pond enclosed by fencing at the south-western corner of grassland pasture G5. The stock fencing of the basin has led to further the dense growth of trees and scrub around the margins of the basin predominately of grey willow *Salix cinerea* around the pond edge, with oak *Quercus robur* and intermixed birch *Betula* sp. and blackthorn *Prunus spinosa* closer to the fence. This overhangs and completely shades the pond basin, with some of the willows having collapsed and fallen into the pond and subsequently rooted within the water. The pond is now very shallow with a considerable drawdown zone evident and just 0.5m depth of water at its deepest point, above a deep layer of rotting leaves and woody debris, overlying a clay base. The entire water surface was covered with a thick carpet of the invasive least duckweed *Lemna minuta* (as listed on Schedule 9 of the Wildlife & Countryside Act 1981) which further shades the water and was the only flora present in the pond. Aquatic invertebrate meso-habitats were limited to mats of submerged willow roots, consequently the invertebrate community was extremely poor in both numbers and diversity, the least diverse of the three ponds in the survey.

Whilst PSYM classified the pond as being of 'very poor' ecological quality, the CCI indicated a community of 'high' interest, but this highlights one of the prime weaknesses of this index, which does not work when based on communities of very few taxa; just two scoring taxa were present, resulting in an artificial elevation of the result. It is more likely that the community is of 'moderate' interest based on the presence of larvae of the uncommon diving beetle *Acilius sulcatus*, Empty *Limnephilus* caddis larval cases amongst the debris at the base of the pond indicated they formerly

occurred in this pond, possibly at a time when it was much more open and provided a suitable haven for a more diverse community.

Smooth newts *Lissotriton vulgaris* were collected in the net during invertebrate sampling indicating the pond's use as a breeding site.

Pond 2

Pond 2 was the most open of the four ponds and was subsequently the most diverse in terms of both its flora and fauna, although it too appears to be in the later stages of succession and its flora and fauna were still somewhat restricted for a lowland pond in southern England. Ancillary features, including a stile to cross the fence, a crude bridge to access a small island and a short reach of open margin on its south-western edge, suggest that it was once used as a fishing pond, although no evidence of fish were noted during the survey.

As with Pond 1, the basin lies within a fenced enclosure in open pasture (grassland parcel G4). Trees and shrubs, mostly of *Salix cinerea*, with intermixed *Q. robur* and *P. spinosa* almost entirely surround the pond, with the exception of the aforementioned open margin on the southern side of the pond, with overhanging branches shading much of the margins. Several willows have collapsed and fallen into the north-western corner, which is heavily shaded, and willows have rooted in the water on the northern side of the main basin. Silt has accumulated around their bases forming an elongated 'floating' island, reached by a crude plank bridge. The southern margin of the pond is less shaded, which has allowed the growth of a few scattered marginal plants, including water mint *Mentha aquatica*, water plantain *Alisma plantago-aquatica*, gypsywort *Lycopus europaeus*, creeping bent *Agrostis stolonifera*, blunt-fruited water-starwort *Callitriche obtusangula* and occasional clumps of rushes *Juncus* sp. A similar community has also developed around the western side of the island, where less shaded by overhanging branches.

The open water in the middle of the basin is shallow, approximately 0.5m to 1m deep, overlying a clay base, vegetated in places with *Spirogyra* algae. The margins are relatively steeply sloping, which has perhaps hampered the development of more extensive marginal floral communities, since the margins are much less shaded than Ponds 1 and 4. It is also surprising that a more diverse community of submerged plants has not developed, as the water is relatively clear and lacking the thick coverage of *Lemna* characteristic of the other two ponds, although this could be testament to a

past legacy of fish stocking, despite the apparent lack of their presence during the survey. Carp are bottom-feeders and as such they tend to stir up the substrate causing murky conditions that hinder the establishment of submerged plant species, thus a recent absence of fish would suggest that first algae have begun to colonise the pond, with aquatic plant species to follow in subsequent years.

The aquatic invertebrate community was fairly diverse, although still somewhat restricted for a pond of this nature, with much of the water being relatively open and lacking in vegetation, aside from algal mats, and the majority of the fauna being present amongst the marginal vegetation along the southern margin and around the western edge of the island, and submerged *Salix* root mats. The CCI indicated an assemblage of 'fairly high' conservation interest. It was because of the presence of this fairly diverse invertebrate community, including a few species that have restricted distributions nationally although not uncommon in Sussex, that PSYM classified Pond 2 as being of 'good' ecological quality, although the Index of Biotic Integrity (78%) was only just over the threshold value of 75%. PSYM relies on Family taxonomic level data only and an examination of the actual species present in fact suggests a somewhat more restricted beetle fauna than one would expect in such a lowland pond. However, the disappearance of many such ponds from the wider British landscape over recent decades serves to highlight how even what might be thought of as a relatively poor pond botanically, is considered to be of ecological importance.

Other species of note observed during the survey included smooth newt adults and larvae, as well as adult common blue damselflies *Enallagma cyathigerum* and a solitary migrant hawkler *Aeshna mixta*. Nymphs of the latter, along with those of the emperor dragonfly *Anax imperator* and red-eyed damselfly *Erythromma najas* indicate the pond as a breeding site.

Pond 4

Pond 4 lies at the edge of woodland at the northern edge of the site and, as with Pond 1, is both heavily shaded by surrounding trees and in the advanced stages of succession, resulting in restricted floral and faunal communities. The pond is relatively large in area with a substantial drawdown zone evident at the time of the survey. It is fed by run-off from the adjacent fields and woodland, with a dry overflow channel in the northern corner. The central basin consists of a very shallow layer of water, just 10 to 20cm in depth, overlying a deep layer of silt and decaying leaves and woody debris, above what is assumed to be a clay base. The entire water surface is covered with a