Leonardslee Lakes and Gardens, East Sussex

Bat Dusk Emergence Survey Report

Report for Leonardslee Lakes and Gardens

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Summary of Key Findings

Temple was commissioned by Leonardslee Lakes and Gardens in March 2024 to undertake a suite of bat dusk emergence surveys at Honey Cottage, Red House and Clocktower Café at Leonardslee Lakes and Gardens ahead of the proposed developments for the Site which include upgrades to loft insulation, improved plant ventilation and creation of a covered courtyard and terrace area. The surveys were required in order to characterise the use of the confirmed roost in Honey Cottage and Clocktower Café, and to identify presence or to reliably infer absence of bats within Red House.

The main findings of the surveys are as follows:

- The Site consisted of three buildings within the "Stables" complex at Leonardslee Lakes and Gardens; Honey Cottage, Clocktower Café and the Red House. The buildings are located within the grounds of Leonardslee Lakes and Gardens. The entire Site is categorised as Woodpasture and Parkland Biodiversity Action Plan (BAP) priority habitat. Leonardslee Lakes & Gardens includes large lakes and multiple veteran trees with connecting habitats, all with connectivity to the buildings on Site.
- This assessment follows on from a Preliminary Roost Assessment (PRA) of the Clocktower Cafe carried out by Temple in 2022 (Temple, 2023) and a PRA of both Honey Cottage and Red House carried out by Temple in 2024 (Temple, 2024a). An assessment of two trees (T118 and T119) for their perceived suitability for bats which are required for removal was also undertaken in 2024 during a Preliminary Ecological Appraisal (PEA) of the habitats on Site.
- The PRA surveys undertaken on both the Clocktower Café and Honey Cottage, identified both buildings as being a confirmed roost for brown long-eared bats, *Plecotus auritus*, as determined through DNA analysis of droppings. The PRA of the Red House identified the building as having Moderate suitability to support roosting bats.
- In line with current survey guidelines, roost characterisation surveys were conducted on both Honey Cottage and Clocktower Café due to their confirmed presence of brown long eared bat droppings in order to determine the type of roost present and two dusk emergence surveys were conducted on the Red House due to the buildings

Moderate suitability for roosting bats. Dusk emergence surveys were undertaken between May and July 2024 in line with current guidelines (Collins, 2023).

- Twelve bats, identified as bats within the Plecotus genus, were recorded emerging from a square hole in the north-east corner of the Clocktower Café close to the location of the clock tower, on May 13, 2024. Due to the high numbers of bats recorded and large numbers of droppings recorded during the PRA, the Clocktower Café is considered to be a maternity roost for brown long-eared bats. No bats were recorded emerging from both Honey Cottage and from within the proposed working area of the Red House.
- Four species of bat and two groups of bats were recorded on Site at the time of the surveys. The Site is assessed as important for roosting bats at District level and important at Site level for foraging bats in accordance with the Bat Mitigation Guidelines (Reason and Wray, 2023).
- In the absence of mitigation, the development proposals have the potential to indirectly impact upon roosting bats through disturbance via artificial lighting, noise and vibration during the construction and operational phases, resulting in the potential fragmentation and abandonment of any on site and/or off-site roosts.
- A European Protected Species Mitigation (EPSM) Licence is not required for the works currently but works should proceed under a Precautionary Working Method Statement (PWMS) to reduce and/or eliminate the risk of disturbance including sensitive timings of works. A PWMS should be produced ahead of the works commencing.
- Recommendations for the enhancement of the Site with regards to bats in accordance with the Environment Act 2021, national and local planning policies and the principle of Biodiversity Net Gain, include improving habitat dark-sky friendly lighting, replacement tree planting to provide foraging habitat, a sensitive lighting scheme to ensure connectivity remains and the provision of bat boxes.

1 Introduction

BACKGROUND TO COMMISSION

1.1 Temple was commissioned by Leonardslee Lakes and Gardens in March 2024 to undertake a suite of bat dusk emergence surveys at Honey cottage, Red House and Clocktower Café at Leonardslee Lakes and Gardens. The surveys were required in order to characterise the use of the confirmed roost in Honey Cottage and Clocktower Cafe and to identify presence or to reliably infer absence of bats within Red House. The surveys covered Honey Cottage, Clocktower Cafe and Red House (henceforth referred to as 'the Site') as shown on the survey result maps in Appendix 1.

1.2 This assessment follows on from a Preliminary Roost Assessment (PRA) of the Clocktower Cafe carried out by Temple in 2022 (Temple, 2023) and a PRA of both Honey Cottage and Red House carried out by Temple in 2024 (Temple, 2024a). An assessment of two trees (T118 and T119) for their suitability to support roosting bats which are required for removal was also undertaken in 2024 during a Preliminary Ecological Appraisal (PEA) of the habitats on Site. The assessment determined the trees do not have suitably to support roosting bats as discussed within the PEA report (Temple, 2024b).

1.3 The PRA undertaken on both the Clocktower Café and Honey Cottage, identified both buildings as being a confirmed roost for brown long-eared bats, *Plecotus auritus,* as determined through DNA analysis of droppings identified. The results of the PRA on the Clocktower Café also suggested this building contained a maternity roost for brown long-eared bats due to the large number of droppings recorded. The PRA of Red House identified the building as having Moderate suitability to support roosting bats.

1.4 This report documents the results of the suite of dusk emergence surveys of Honey Cottage, Clocktower Cafe and Red House, undertaken by Temple in May, June and July 2024.

SCOPE OF REPORT

1.5 The primary aims are, through a process of investigation and assessment, to determine if any bat roosts are present, what the type of roost may be, the species using them, their status and relative conservation importance and any likely impacts or licencing requirements that could occur as a result of the proposals. It also provides an assessment of the value of the habitats present on Site for foraging and/or commuting.

1.6 The assessment of this Site for bats is based on the following sources of information, including that obtained from third parties and the results of surveys:

- Preliminary Roost Assessment, Temple, 2022;
- Preliminary Roost Assessment, Temple, 2024; and
- Preliminary Ecological Appraisal, Temple, 2024.

1.7 Where suitability for a roost was identified, a suite of dusk emergence surveys are required to confirm presence or likely absence, to determine the species present, and to characterise any roosts identified. Where roosts are found to be present, then an evaluation of the conservation value of the species concerned will be made and the impacts of the development identified and addressed.

1.8 This assessment has been prepared with reference to the best practice guidance (Collins, 2023), the current guidance at the time of the survey. The BSI Standards Publication 42020:2013 Biodiversity – Code of Practice for Biodiversity and Development (British Standards Institution, 2013), were also adhered to. In addition to, Reason, P.F. and Wray, S. (2023). *UK Bat Mitigation Guidelines* and CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland.*

1.9 This report provides supporting information in the appendices with a georeferenced map of the survey results and emergences in Appendix 1 and tables showing typical bat emergence times, bat assemblages and their importance in Appendices 2, 4, 5 and 6. Relevant legislation is outlined in Appendix 3 with the standard guidance for

mitigation, compensation and enhancement outlined in Appendix 7 and screenshots of the view at each location and the darkest point using Night Vision Aids in Appendix 8.

SITE CONTEXT AND STATUS

1.10 The survey consisted of two buildings within the "Stables" complex at Leonardslee Lakes and Gardens; Honey Cottage which is centred on Ordnance Survey National Grid Reference TQ 22192 25958, Clocktower Café, adjoined to Honey Cottage to the south and centred on Ordnance Survey National Grid Reference TQ 22186 25981 and the Red House located outside of the Stables complex approximately 80m north of these buildings and centred on Ordnance Survey National Grid Reference TQ 22134 26066. For a Site context map, see Appendix 1, Figure 1.

1.11 The Site is located within the grounds of Leonardslee Lakes and Gardens, a 97ha Grade I listed garden, comprising lakes, a vineyard and associated buildings. Honey Cottage is a two-storey residential property occupied by employees of Leonardslee Lakes and Gardens which forms part of the Stables complex. The Clocktower Café, also part of the Stables complex, is a single-storey café building with an internal kitchen, shop front and indoor seating area with an outdoor seating area within a courtyard to the south and west. Two further buildings, outside of the scope of this report, Offices and Potters (surveyed in 2022 and 2024 [Temple, 2023 and Temple, 2024a]) also form part of the Stables complex to the west of the Site.

1.12 The Red House is a two-storey building currently used as offices and a staff recreation room 80m north of the Stables complex. The Red House forms part of a 'H' shaped building and occupies the western side of the 'H' adjoining to a private two-storey residential property to the east with linking connectivity between the two halves of the 'H' via the loft space (Temple, 2024a).

1.13 The buildings on Site are situated in close proximity to walkways, introduced shrub, non-native and ornamental hedgerow, with deciduous woodland within 0-10m east of each building and ancient woodland within 30-45m east of each building. Each

Site is situated within Woodpasture and Parkland Biodiversity Action Plan (BAP) priority habitat. The wider Leonardslee Lakes & Gardens ownership boundary includes large lakes and multiple veteran trees with connecting habitats, all in connectivity to the buildings on Site.

DEVELOPMENT PROPOSALS

1.14 Proposed developments to Honey Cottage (Purcel, 2023a and b) include internal alterations and changes to internal partitions. The glass lean-to construction to the south of the building will be removed and replaced with a single-storey extension with stone walls and an insulated slate roof. Works are not proposed to directly affect the roof or roof void of Honey Cottage.

1.15 A terrace is proposed to be built to the west of the Clocktower Cafe, into adjacent woodland (Purcel, 2023a and b). The terrace will finish at the northern garden wall of Honey Cottage and will not extend to the east of Honey Cottage itself. In order to facilitate the development of the terrace, two trees, T118 and T119 (Temple, 2024b), will be required for removal.

1.16 A new courtyard timber structure with glazed roof covering is proposed to be installed in the centre of the Stables complex adjacent to the Clocktower Cafe and restaurant to the north and east. The proposed new courtyard structure is planned to be fixed to the Clocktower Cafe and restaurant only and not to any other buildings within the scope of this assessment.

1.17 Proposed works to the Red House include internal alterations and change of internal partitions to the western part of the building only (the eastern part of the 'H' shaped building is not within scope for this report). The roof of "Office 1" will require insulating to achieve a U-value of 0.16 in line with the change of use. This is likely to be mineral wool between battens fixed to the underside of the existing rafters with a plasterboard lining internally.

RELEVANT LEGISLATION AND PLANNING POLICY

1.18 The following key pieces of nature conservation legislation are relevant to this assessment. A more detailed description of this legislation is provided in Appendix 4.

- 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
- Environment Act 2021.

1.19 The actions that could result in an offence occurring under the above legislation include: the disturbance of bats within (and, in some cases, away from) a roost; loss or damage of a roost; obstructing access to or from a roost; or modification of a roost[1]. If development proposals are likely to result in an offence, then a mitigation licence must be obtained from Natural England prior to works, to provide a derogation from the relevant legislation. Alternatively, where no more than three low conservation significance roosts are present and are used by low numbers of bats of no more than three of the (qualifying) species that mitigation licences are most commonly applied for, it may be possible to register the Site under the Bat Mitigation Class Licence (BMCL) scheme.

1.20 The National Planning Policy Framework (Department for Levelling Up, Housing & Communities, 2023) requires public authorities to contribute to and enhance the natural and local environment including by minimising impacts on and providing net gains for biodiversity when taking planning decisions. The Environment Act, 2021 has strengthened the duty to conserve biodiversity within the Natural Environment and Rural Communities Act 2006, such that all public authorities are required to conserve and enhance biodiversity.

[1] These actions are inferred from Section 43.1 and 43.2 of *The Conservation of Habitats and Species Regulations 2017* (as amended).

1.21 Section 41 of the NERC Act 2006 requires the Secretary of State to publish and maintain lists of species and types which are regarded by Natural England to be of "Principal Importance" for the purposes of conserving biodiversity in England.

1.22 The following species of bats are listed under Section 41 and are therefore a material consideration in the making of planning decisions: barbastelle *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros.*

1.23 Other planning policies at the local level which are of relevance to this Site include: the Horsham District Local Plan 2021- 2038 including *Policy 31: Green Infrastructure and Biodiversity* and The High Weald Area of Outstanding Natural Beauty (AONB) Management Plan 2019-2024 including their objective for dark sky-friendly lighting' (objective OQ4).

1.24 Bats are listed in the Sussex Biodiversity Action Plan with all three of the Priority Species and Species of Conservation Concern found roosting and/or foraging/commuting on Site including common pipistrelle *Pipistrellus pipistrellus*, Noctule *Nyctalus noctula* and brown long-eared bat.

2 Methodology

DESK STUDY

2.1 A desk study was previously undertaken for the PRA of the wider Site boundary (Temple, 2023) in order to provide contextual information during the survey design stage and when evaluating survey results and likely impacts of the proposed site. the results of the desk study are included in the PRA and PEA reports for the Site (Temple, 2023, 2024a and 2024b). The following information for the Site and its surroundings was collated and reviewed during the desk study.

Previous Surveys

2.2 The ecological assessments which relate to bats on Site are listed below, followed by a summary of the details pertinent to this assessment:

- Stable Block, Leonardslee Lakes and Gardens Preliminary Ecological Appraisal and Preliminary Roost Assessment (PRA) (Temple, 2023)
- Potters Cottage, Offices, Honey Cottage & Red House, Leonardslee Lakes and Gardens, East Sussex Preliminary Roost Assessment (PRA) (Temple, 2024a)
- Garden Entrance, Honey Cottage, Clock Tower Cafe and Village Centre, Leonardslee Lakes and Gardens, West Sussex, Preliminary Ecological Appraisal (Temple, 2024b)

Local Biological Records Centre

2.3 A data search relating to bats within a 2km radius of the Site, as made available by the Sussex Biological Records Centre during the initial baseline assessment of the Site in 2022 was obtained.

Online Resources

2.4 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 ancient semi-natural woodland (ASNW), statutory designated nature conservation sites and extant or historic mitigation licences for bats within 2km of the Site; 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.

BAT SURVEYS

Aims and objectives

2.5 The aim of the survey methodologies outlined below is to establish the suitability for the Site to support bats including for roosting, foraging, commuting and swarming and to establish presence/likely absence of bat roosts within Honey cottage, Clocktower Cafe and Red house on Site. An iterative approach to survey design is followed whereby each stage informs the next. Where presence is established, the secondary aim is to obtain sufficient information to characterise the type of roost according to criteria set out in the guidelines (Collins, 2023) and the importance of the habitats present. This includes determining the function/s of the Site for bats for all roost types (including maternity, hibernation, satellite, transitional, day, night and feeding roosts), foraging, commuting and swarming.

2.6 The suitability of the Site for roosting bats is assessed separately to foraging and flight paths due to the fact that they are interchangeable e.g. low suitability roosting habitats can be present within habitats of high foraging or commuting (Collins, 2023). The gathered information is used to undertake an assessment of the potential impacts of the development proposals and develop an appropriate and proportionate mitigation strategy. Where possible, in accordance with the mitigation hierarchy, it also outlines any avoidance, mitigation, compensation and enhancement measures as may be required to ensure compliance with legislation and policy.

Survey Area

2.7 The surveys covered Honey Cottage, the Clocktower Café and the Red House within the Site boundary (see Figure 1, Appendix 1).

Dusk emergence surveys

2.8 Dusk emergence surveys were carried out across the following dates; 13 May, 12 June, 16 July, 17 July, 23 July 2024 by the following personnel:

- Francesca West MRes BSc (Hons)
- Amy Richards MSc BSc (Hons) MCIEEM
- Kathryn Bugler MSc BSc
- Milla Timms MSc BSc (Hons)
- Maisie Worthington BSc (Hons)
- Theresa Stewart BSc (Hons) MSc MCIEEM (Licence number Level 2: 2014-5200-CLS-CLS; Level 4: 2020-44563-CLS-CLS)
- Jennifer Crossman, BSc (Hons), FdSc ACIEEM pending
- Maddy Thomson, BA (Hons)
- Harry Fishlock BA (Hons)

2.9 Three dusk emergence surveys were conducted on both Honey Cottage and Clocktower Café in accordance with best practice guidelines (Collins, 2023) due to their confirmed presence of brown long-eared bat droppings determined via DNA analysis (Temple, 2024a). Supplementary static detectors were also placed in the roof void of the Clocktower Café ahead of each dusk emergence survey.

2.10 Two dusk emergence surveys were conducted on the Red House due to the buildings Moderate suitability for roosting bats in accordance with best practice guidelines (Collins, 2023).

2.11 Surveyors used Elekon Batlogger M detectors during the dusk emergence surveys and the static detectors placed within the roof space of the Clocktower Café were Elekon Batlogger A+'s. The Batlogger M and A's have a full spectrum microphone to make bat calls audible and records zero crossing data to enable subsequent analysis of files as sonograms for later analysis using BatExplorer software. Both the Elekon Batlogger M and A+ detectors are calibrated and tested yearly in accordance with best practice (Collins, 2023).

2.12 In line with the Bat Conservation Trust (2022) interim guidance note, and as supported by Collins (2023), surveys involved use of a mix of infra-red and thermal imaging cameras (night vision aids (NVA) paired with surveyors to assist with the emergence surveys. Infra-red cameras used were Canon XA HD models and thermal imagining cameras comprised FLIR T1020 models.

2.13 Sufficient survey locations were used to allow clear views of all potential roost entry/exit points identified during the preliminary roost assessments (Temple, 2023 and Temple, 2024a). Each of the surveyors noted down details of any bat activity including: bat passes[2], type of registration (i.e. heard and/or seen), species, numbers, location, emergence or re-entry, foraging, socialising and commuting, recording details to a data sheet and a map. Where standalone cameras were used these were paired with either an Elekon Batlogger M or A+ and the footage and sound analysed post-survey.

2.14 The dusk emergence survey commenced 15 minutes before sunset and continued for up to two hours after sunset. Table 2.1 summarises the survey times and weather conditions.

[2] For the purposes of this assessment a bat pass is taken to be a series of individual registrations by an individual bat that are emitted in a short sequence and either heard or recorded as a bat passes the position of the surveyor or the detection envelope of the recorder that is employed.

Table 2.1: Survey date and conditions

Date of Survey and Building Reference	Sunset	Survey Timings		Temperature (°C)		Wind Speed (Beaufort Scale)		Cloud Cover (Oktas)		Precipitation	Moon Phase
		Start	End	Start	End	Start	End	Start	End		
13/05/2024 Honey Cottage & Clocktower Cafe	20:42	20:27	22:42	17	16	3	3	8	8	0	Waxing Crescent
12/06/2024 Honey Cottage & Red House	21:16	21:01	23:16	15	12	1	1	3	3	0	Waxing Crescent
17/06/2024 Clocktower Cafe	21:18	21:03	23:18	18	16	0	0	0	0	0	Waxing Gibbous
16/07/2024	21:08	20:53	23:08	20	19	0	0	7	8	0	Waxing Gibbous

Date of Survey and Building Reference	Sunset	Survey Timings		Temperature (°C)		Wind Speed (Beaufort Scale)		Cloud Cover (Oktas)		Precipitation	Moon Phase
		Start	End	Start	End	Start	End	Start	End		
Red House											
17/07/2024 Honey Cottage	21:07	20:52	23:07	19	15	1	1	0	0	0	Waxing Gibbous
23/07/2024 Clocktower Cafe	20:59	20:44	22:59	21	19	0	0	8	8	0	Waning Gibbous

Post Survey Analysis

2.15 BatExplorer™ software was used to analyse recordings of bat calls following the surveys and confirm species identification, as well as timings of any passes. Any passes likely to have originated from one of the Myotis species were determined to genus level only due to the complexity of differentiating between these species. Pipistrelle calls recorded at between 45kHz and 50KHz were generally assigned as being common pipistrelle with those at between 50KHz and 55KHz as soprano pipistrelle. Any pipistrelle bats recorded at 50KHz were assigned as Pipistrelle sp. Video footage was reviewed post-survey where standalone cameras were used or where bat passes need to be verified with any bat activity including emergences and return to roosts noted down and confirmed during the review of the footage with sonogram data and survey proformas. Survey proformas are available on request, if required.

Artificial Lighting

2.16 Luminance levels on Site were recorded at the end of the dusk emergence surveys and recorded in lux by a Testo 540 lux meter, the recordings were undertaken in accordance with best practice guidance (ILP, BCT, 2023).

2.17 The moon phase along with artificial lighting, is known to have an impact on bat activity. During the survey the moon phase was recorded and when evaluating bat activity this is taken into account in accordance with best practice guidelines (Collins, 2023 & ILP, BCT, 2023).

Assessing Importance for Bats

2.18 The EcIA guidelines (CIEEM, 2018 v1.2) recommend describing importance by assigning a feature to a geographic frame of reference, i.e., international, national, regional, County, Vice-County, council area or other local authority wide area and local.

2.19 Importance has been assessed at an appropriate spatial scale, based on species distribution, conservation status, current population trends, functionality of the Site and the Zone of Influence (ZoI) [3]of the project as it relates to bats.

2.20 Conservation status varies between the different counties of the UK, reflecting current understanding of abundance and distribution. Table 1 in Appendix 4, sets out the current categorisation of species, reflecting their relative abundance across the UK. The absence of a species does not mean that they are not preset in that region/county, when rarities do occur their value should be specifically addressed and counted as rare in that region/county.

2.21 The geographical variation set out in Table 1, Appendix 5 underpins the subsequent assessment of the importance of roosts, commuting routes and foraging areas, and of the overall assemblage of bats present on a site. The boundaries between categories are not absolute and should be treated with caution.

Assessing the importance of roosts

2.22 Bats use many different types of roost, notably for mating, raising young and overwintering, and not all roosts have the same level of importance in supporting local bat populations. Surveys should aim to sufficiently categorise each roost through appropriate survey effort, by collecting sufficient survey information to undertake an informed impact assessment. This does not necessarily mean the minimum survey effort outlined within the guidance (Collins, 2023).

2.23 The importance of roosts has been evaluated in accordance with Table 1, Appendix 5 which identifies the importance of different types of roost. In all cases, the geographic scale set out presents a likely minimum and modifying factors may increase the importance assigned to roosts.

[3] CIEEM (2017) defines the term Zone of Influence as 'the areas/resources that may be affected by the biophysical changes caused by activities associated with a project' The ZOL may not be the same as the boundary of the site (BCT, 2023).

Assessing the Importance of bat assemblages

2.24 It is inherently more difficult to assess the value for foraging and commuting bats and this requires a higher degree of professional judgement. For example, some routes may only be used at certain times of the year, and therefore show low numbers of bat passes, but they may be critical routes to hibernation sites. As such the importance of commuting and foraging areas should not be interpreted in isolation and should be made based on all available data for bat activity in the area.

2.25 The standard method provided in Tables 1 and 2 in Appendix 6 was used in accordance with best practice guidance (Collins, 2023) to assess the importance of an assemblage. Assigning a level of importance to an assemblage provides contextual information only; it is not expected that the assemblage as a whole would be assessed as a single receptor. As with the importance of roosts, commuting routes and foraging areas, this approach has been developed to reflect geographic variations in species distributions.

EVALUATION AND IMPACT ASSESSMENT

2.26 Where sufficient baseline data are available, the Site's ecological importance has been evaluated broadly following guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) which ranks the nature conservation importance of a site according to a geographic scale of reference: international and European, UK/national, regional (South East), Metropolitan, County, vice-County, Council area (West Sussex), or other local authority-wide area (Horsham District Council) and local. In evaluating the nature conservation importance of the Site, the following factors were considered: nature conservation designations; species/habitat rarity; naturalness; fragility and connectivity to other habitats. Where no importance has been assigned this is due to insufficient information.

2.27 An assessment of likely ecological impacts has been undertaken in accordance with CIEEM guidelines (CIEEM, 2018) only where clear evidence is available to

substantiate and justify the findings. In the absence of such evidence, the ecological feature is merely identified as a potential constraint to development. Reference is also made to Section 6 of the Bat Mitigation Guidelines (Reason and Wray, 2023) and Natural England's standing advice and includes a summary of the scale of impact according to roost type and development effect, if known.

2.28 Where ecological constraints to development are identified, further survey requirements and/or mitigation measures that are proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development are described. In addition, in accordance with the Environment Act 2021, National Planning Policy Framework (NPPF) and local/regional planning policies, opportunities to enhance or create benefits for wildlife are provided where this is possible based on the information available to date. These measures may be appropriate for the attainment of net gains in biodiversity, although this assessment does not provide a formal measure of Biodiversity Net Gain (BNG) and a BNG report will be produced for submission alongside this assessment as part of the planning application.

DATA VALIDITY AND LIMITATIONS

2.29 It is important to note that even where data are held, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest; the area may be simply under-recorded.

2.30 Where only four figure grid references are provided for protected species by third parties, the precise location of species records can be difficult to determine and they could potentially be present anywhere within the given 1km x 1km square. Equally, six figure grid references are accurate to the nearest 100m only.

2.31 Bats are highly mobile animals and can move roost sites both within and between years. Where surveys are not spread throughout the bat active season it is possible that roost sites that are used for a limited time only could be missed, and the detection of small numbers of crevice dwelling species from an inspection alone

may remain problematic, particularly where droppings accumulate within an inaccessible void such as a cavity wall or above the roof lining. Where visible and undisturbed, however, evidence of bats inside a building is likely to be detectable throughout the year.

2.32 Long-eared bat calls are extremely quiet and are usually only recorded when within a few metres of the detector, therefore, where there is a lack of recordings for this species on Site, it does not indicate that long-eared bats are absent from the survey areas. This is a limitation inherent in surveys of this nature, despite the high-quality equipment being used.

2.33 All electronic bat detectors have a level of bias. To reduce this bias the same detector type was employed by surveyors between each survey visit, wherever possible. Both Batlogger M and Batlogger A+ detectors were used as these are known to be good at detecting quieter calling bat species such as brown long-eared bat and therefore the risk of missing such species is reduced.

2.34 The survey conditions when undertaking emergence surveys can limit visibility, with lighting during a dusk being optimum at the beginning and becoming darker throughout the survey. In line with recent guidelines, infrared NVA's were used by each surveyor which help to increase the visibility during periods of low light and which can be used later on to confirm emergence behaviour.

2.35 Vegetation growth associated with the area of woodland to the east of the Clocktower Café restricted visibility along the eastern elevation. Following the first survey on the 13 May 2024, this location was deemed ineffective at observing bat passes or emergences. The surveyors located at both the south-east and north-east of the Clocktower Café were able to view the eastern elevation from their positions and so could detect, by the angle, height and sound, if a bat had emerged from this elevation.

2.36 No light lux readings were taken during the emergence survey on the Red House on the 12 June 2024 due to human error. However, readings were taken on the final

emergence survey in July and light conditions had not changed on Site and as such this is not considered a significant limitation.

2.37 External security lighting, both motion-sensing and permanent, did pose an initial limitation during the first survey undertaken on the Clocktower Café on the 13 May 2024 for the surveyors located to the north-west of the cafe and within the courtyard looking north and east making observations difficult. However, following the first survey on the Clocktower Café, both the motion-sensing and permanent security lights in those areas were subsequently turned off for the remaining surveys although this may have caused conditions on Site for the duration of the surveys to change and become more favourable for bats.

2.38 A single motion-sensor light was recorded to the north-east of the Clocktower Café beneath where bats were recording emerging. This light could not be shut off, but it did not obscure the surveyors visibility. Furthermore, although the level of artificial output was high, the light was not directed at the entrance to the roost and was installed beneath a porch.

2.39 The security lights within the courtyard were also illuminated during all three of the Honey Cottage emergence surveys and were in operation between 21:00 and 22:30 on each survey night. This could have deterred emergence for some early emerging species such as species within the *Pipistrellus* genus; however, the lights were downward facing so did not illuminate the eaves of Honey Cottage on the western elevation and the species previously recorded on Site were brown long-eared bats which typically emerge between 30 and 60 minutes after sunset (see Appendix 2). The surveys continued for a minimum of 15 minutes and a maximum of 50 minutes after the lights turned off. Furthermore, only one elevation of Honey Cottage was subject to increased light levels, with the remaining elevations, north, south and east remaining unlit and more suitable for emerging bats.

2.40 Data from bat surveys should be considered to be valid for a period of 18 months, unless there are any significant changes to the buildings or other habitats within the

site (CIEEM, 2019). Data used to support a mitigation licence application to Natural England must be from the most recent survey season; depending on the timing of the application, this may mean from the same or previous year.

3 Results

DESK STUDY

3.1 The data search previously undertaken for the PRA report (Temple, 2024a) obtained from SxBRC, returned 62 records of bats from within the past ten years from at least eight species and two species groups. Of these records, 16 were roosts and the remainder were field records. 13 roosts were recorded within 2km of the Site in the last ten years. One roost from 2017 was previously recorded within the Stable Block of which the Clocktower Café and Honey Cottage are a part of.

3.2 Many were also recorded within nearby buildings such as the Leonardslee House with a single historic record of a hibernation roost from 1992, within the Ice-House associated with Leonardslee House. Two historic mitigation licences were found within a 2km radius of the site. A summary of the results is presented in Tables 3.1 and 3.2.

Table 3.1: Summary of data search results

Species	Distance & Orientation	Date of most recent record	Description
Brown Long-eared Bat	On site	16/11/2017	The Stable Block, Leonardslee Estate, Building inspection, unspecified roost
Brown Long-eared Bat	70m south	16/11/2017	The Manor House, Leonardslee Estate. Building inspection, unspecified roost
Brown Long-eared Bat	75m north-west	20/06/2019	Leonardslee House & Gardens. One roosting in the building.
Brown Long-eared Bat	75m north-west	05/09/2019	Leonardslee House & Gardens. One bat emerged from building, unspecified roost
Brown Long-eared Bat	75m north-west	24/09/2019	Leonardslee House & Gardens. One bat emerged from building, unspecified roost
Soprano Pipistrelle	75m north-west	25/09/2019	Leonardslee House & Gardens, one bat emerged from building, unspecified roost

Species	Distance & Orientation	Date of most recent record	Description
Soprano Pipistrelle	75m north-west	24/09/2019	Leonardslee House & Gardens, 1 bat emerged from building, unspecified roost
Soprano Pipistrelle	75m north-west	05/09/2019	Leonardslee House & Gardens, four bats emerged from building, unspecified roost
Common Pipistrelle	75m north-west	24/09/2019	Leonardslee House & Gardens, two bats emerged from building, unspecified roost
Common Pipistrelle	75m north-west	05/09/2019	Leonardslee House & Gardens, two bats emerged from building, unspecified roost
Natterer's Bat	105m south-west	15/02/1992	Ice-house, Leonardslee Gardens, Brighton Road, Lower Beeding. 1 bat present during hibernation survey

Table 3.2: Bat mitigation licences within 2km of the Site boundary

Licence Number	Distance & Orientation	Notes
EPSM2010-1637	1.6km south-west	Destruction of a resting place for brown long eared bat, common pipistrelle, soprano pipistrelle. Licence was valid 10/03/2010 to 30/11/2010
2019-43870-EPS-MIT	1.6km south-east	Destruction of a breeding site and resting place for brown long eared bat, common pipistrelle, soprano pipistrelle, whiskered bat. Licence was valid 03/02/2020 to 30/01/2030

DESIGNATED SITES

3.3 No sites designated for bats are present within 2-15km of the Site.

3.4 One non-statutory designated site within 2km of the Site includes habitats suitable for bats within its citation. Old Deer Park Local Wildlife Site (LWS) is located 300m south-east of the Site and includes ancient parkland trees, wet heath, bog, and dry bog and is connected to the Site via woodland.

Significant landscape features

3.5 Deciduous woodland is present within 0-16m to the east and/or north of all buildings within the scope of this report. These areas of woodland extend offsite to the east and make up a large part of the Leonardslee Estate, connecting with large lakes within the wider Leonardslee Estate. Ancient woodland is also present within this woodland, 30m further east. Areas of woodland are well connected to buildings on Site via trees and grassland.

3.6 The habitats surrounding the buildings within the Site boundary are of high suitability for foraging and commuting bats.

FIELD SURVEY

Overview

3.7 Four species of bat and two groups of bat were recorded on Site at the time of the surveys including; common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula* and Serotine *Eptesicus serotinus,* alongside bats within the *Plecotus* and *Myotis* genus.

3.8 Twelve bats were recorded emerging from a square hole in the north-east corner of the Clocktower Café close to the location of the clock tower, on 13 May 2024. Eleven bats were recorded returning to roost with a further seven observed investigating the roost entrance throughout the duration of the survey. The majority of the bats did not echolocate upon emerging, however, the bats recorded returning to roost or recorded investigating returning to roost did echolocate and were identified as bats within the *Plecotus* genus.

3.9 No further bats were recorded emerging from or returning to roost within the Clocktower Café following the first survey undertaken in May.

3.10 Static analysis of two Elekon Batlogger A+'s recorded a single genus of bat during the three surveys: *Plecotus*. The majority of the calls recorded were in the location where the bats were recorded emerging during the survey undertaken in May 2024.

3.11 No bats were recorded emerging from either Honey Cottage or Red House across the duration of the surveys. A single unidentified bat, believed to be a pipistrelle due to the size, time of emergence and flight pattern, was recorded emerging from the adjoining building to the east of the Red House during the final dusk emergence survey undertaken on the 16 July 2024.

3.12 Foraging behaviour of four species of bats was recorded within the area of woodland to the east of the Clocktower Café and Honey Cottage, above the garden space adjacent to the Red House, within the garden of Honey Cottage and above the courtyard associated with the Clocktower Café. Commuting behaviour was recorded following the line of both the Clocktower Café and Honey Cottage buildings.

Presence / Absence Surveys

Emergence survey 1 (13.05.2024)

Honey Cottage

3.13 No bats were recorded emerging from Honey Cottage. In total four species of bat were recorded by the two surveyor's: common pipistrelle, soprano pipistrelle, serotine and noctule.

3.14 In total 33 calls were recorded between 21:12 and 22:42 by the two surveyors with near continuous bat activity recorded during this time. The surveyors observed a range of foraging and commuting behaviour and the majority of the calls recorded were attributed to common pipistrelle.

3.15 The first call recorded was a soprano pipistrelle and occurred at 21:12 approximately 30 minutes after sunset. A single commuting Noctule bat was heard not seen during the survey, at 21:48, approximately 66 minutes after sunset by the surveyor to the south-east aspect of Honey Cottage.

3.16 A foraging Serotine bat was heard but not seen at 21:46 and again at 21:49, approximately 64 and 67 minutes respectively after sunset, by the surveyor positioned in the south-west corner of the site.

3.17 Foraging and commuting behaviour of both common and soprano pipistrelle was concentrated within the garden space of Honey Cottage.

Clocktower Café

3.18 Twelve bats were recorded emerging from a square hole in the north-east corner of the Clocktower Café close to the location of the clock tower, on 13 May 2024. Eleven bats were recorded returning to roost with a further seven observed investigating the roost entrance throughout the duration of the survey. The majority of the bats did not echolocate upon emerging, however, the bats recorded returning to roost or recorded investigating returning to roost were bats within the *Plecotus* genus.

3.19 The emergences occurred between 20:58 and 22:24, approximately 16 and 126 minutes respectively after sunset, with bats returning to roost between 21:30 and 22:39.

3.20 In total five different species of bat were identified by the six surveyors: common pipistrelle, soprano pipistrelle, bats within the *Plecotus* genus and serotine.

3.21 The first call recorded was a common pipistrelle heard not seen by one of the surveyors to the north of the Clocktower Cafe at 20:56 approximately 14 minutes after sunset with the final recording of a single pass from a soprano pipistrelle at 22:42, approximately 120 minutes after sunset. All surveyors recorded both common pipistrelle and soprano pipistrelle being present, both displaying foraging and commuting behaviour with some passes going unseen by the surveyors. Pipistrelle species were the most frequent bat recorded on Site. No pipistrelle bats were recorded emerging from the building during the survey.

3.22 Serotine bats were also present and noted commuting along the northern elevation of the building at 21:46 and 21:48, approximately 64 and 66 minutes respectively after sunset. A single commuting noctule was recorded to the east of the Clocktower Café within the area of woodland at 21:43, approximately 61 minutes after sunset. Neither of these bats were recorded emerging from the building during the survey.

3.23 The final recorded bat was a single pass of a soprano pipistrelle at 22:42, approximately 120 minutes after sunset.

Static analysis 13th – 16th May

3.24 A single species was recorded within the roof void of the Clocktower Cafe, with an abundance of calls made from bats within the *Plecotus* genus.

3.25 The majority of calls were low in frequency and were identified as *Plecotus* type C social calls (Middleton *et al*, 2014), likely showing up as particularly low frequency due to the acoustic properties of the roof void.

3.26 Static location 1, located directly beneath the clock tower in the location of the maternity roost had 350 *Plecotus* calls as opposed to static location 2 above the kitchen which recorded approximately 50 *Plecotus* calls on the night of the 13 May.

Emergence Survey 2 (12.06.2024)

Honey Cottage

3.27 No bats were recorded emerging from Honey Cottage. Only one species was recorded by the surveyors during the survey, common pipistrelle.

3.28 In total 8 calls were recorded between 21:43 and 22:59 by the two surveyors, using the bat detectors. A single common pipistrelle was recorded flying east into the woodland above the café courtyard at 21:43 from a westerly direction, approximately 27 minutes after sunset. Distinctive foraging calls were detected using bat detectors.

Red House

3.29 No bats were recorded emerging from the Red House at the time of the survey. Four species of bat were recorded during the survey: common pipistrelle, soprano pipistrelle and bats within the Myotis and *Plecotus* genus'.

3.30 In total 12 calls were recorded between 21:36 and 23:14, approximately 20 and 118 minutes respectively after sunset, by the three surveyors, using the remote bat detectors. Five calls were noted as being soprano pipistrelle, three common pipistrelle, two calls from bats within the *Myotis* genus, and two from bats within the *Plecotus* genus.

3.31 All bats recorded on Site were heard not seen.

Emergence Survey 3 (17.06.2024)

Clocktower Café

3.32 No bats were recorded emerging from the Clocktower Café during the second survey. Three species of bat were recorded on Site, common pipistrelle, soprano pipistrelle and bats within the Myotis genus.

3.33 Bat activity was significantly lower during this survey. Foraging and commuting bats were recorded within the area of woodland to the east of the Clocktower Café and low above the garden space of Honey Cottage to the south of the Clocktower Café. The first bat recorded on Site was a common pipistrelle at 21:27 approximately nine minutes after sunset. This bat was seen commuting above the Clocktower Café and into the woodland to the east. Common pipistrelle were recorded throughout the survey with the final recording at 23:15 approximately three minutes before the survey ended.

3.34 A single unknown bat species was seen flying from the direction of Potters Cottage to the west of Clocktower Café at 21:39 approximately 21 minutes after sunset, over the courtyard and into the woodland to the east. This bat did not echolocate.

Static analysis 17th – 19th June

3.35 A single species was recorded within the roof void of the Clocktower Cafe, with an abundance of calls made from bats within the *Plecotus* genus.

3.36 The majority of calls were once again low in frequency and were identified as *Plecotus* type C social calls (Middleton *et al,* 2014), likely showing up as particularly low frequency due to the acoustic properties of the roof void.

3.37 The detector deployed at location 2, above the kitchen space, had zero recordings due to an equipment fault. The detector deployed at Location 1, beneath the clock tower in the roof void, had significantly fewer calls than the previous month.

Emergence Survey 4 (16.07.2024)

Red House

3.38 No bats were seen to emerge from the proposed development area. An unknown species of bat was recorded emerging from the eastern elevation of the adjoining residential house at 21:15, approximately seven minutes after sunset. The bat did not echolocate, however, due to the time of emergence, flight pattern and size of the bat, it is believed to be common pipistrelle.

3.39 Four species of bat were recorded on Site at the time of the survey: common pipistrelle, soprano pipistrelle, bats within the *Myotis* genus and serotine.

3.40 Bats were recorded commuting around Site with both soprano pipistrelle and Serotine bat recorded foraging along the vegetation to the west of the Red House and above the building itself.

3.41 Bat activity commenced at 20:53 approximately 15 before sunset, with the first recording of a soprano pipistrelle, and lasted the duration of the survey until 22:57.

Emergence Survey 5 (17.07.2024)

Honey Cottage

3.42 No bats were recorded emerging from Honey Cottage during the survey.

3.43 Bat activity was recorded throughout the survey, with 36 calls recorded by the surveyors and the remote detectors. Three species were recorded – common pipistrelle, serotine and soprano pipistrelle.

3.44 The first call recorded was a common pipistrelle at 21:22 approximately 15 minutes after sunset. This species accounted for the majority of the activity observed, being recorded 21 times during the survey, between 21:22 and 23:06. Some individuals were seen foraging above the garden space and above the courtyard to the west of Honey Cottage. The majority of the calls were heard not seen.

3.45 A single serotine bat was heard not seen during the survey, at 21:21 approximately 14 minutes after sunset by both surveyors.

3.46 Soprano pipistrelles were recorded 13 times during the survey, between 21:31, approximately 24 minutes after sunset, and 23:02. Some individuals were seen foraging above the garden. The majority of the calls were heard not seen.

3.47 Numerous bats were heard not seen by both surveyors with significant levels of foraging activity recorded over the small garden to the South of Honey Cottage as well as along the eastern aspect of the house.

3.48 There was a significant decrease in ambient temperature during the survey from 19 to 15 degrees Celsius and a heavy dew formed. This did not appear to have any effect on the bat behaviour.

Emergence Survey 6 (23.07.2024)

Clocktower Café

3.49 No bats were recorded emerging from the Clocktower Café during the final emergence survey.

3.50 Six species of bat were recorded on Site: common pipistrelle, soprano pipistrelle, Noctule bat, Serotine bat and bats within the Myotis and *Plecotus* genus.

3.51 Foraging and commuting behaviour of both common and soprano pipistrelle was recorded within the woodland to the east of the Clocktower Café, within the garden space of Honey Cottage and above the hardstanding to the south of Site. This behaviour was observed between 21:15, approximately 16 minutes after sunset and 22:20 approximately 81 minutes after sunset.

3.52 Bat activity commenced at 21:15 approximately 16 minutes after sunset and continued until the end of the survey at 22:59. The first *Plecotus* recording was a bat heard not seen at 21:50, approximately 51 minutes after sunset.

Static analysis 23rd July

3.53 No bats were recorded on either static detector deployed within the roof void suggesting the roost was unoccupied.

Artificial lighting

3.54 Lux levels ranged from 0 to 4 lux with all surveyor locations for all buildings, with the exception of the northern aspect of the Clocktower, measuring 0 lux. The only location where the lux reader measured higher than 0 was to the north-east of the Clocktower Café beneath the location of the previously recorded bat emergences. This was due to the level of artificial light produced by a security light above the rear kitchen door.

Sound Analysis

3.55 It was possible to analyse and attribute all bat calls down to species level using special software where required. No additional species of bat were recorded during the sound analysis than those identified on site.

4 Evaluation and Impacts

EVALUATION

Roost Sites

4.1 The May 2024 surveys recorded twelve individual bats, believed to be brown long-eared bats based on bat call analysis and DNA analysis of droppings, emerging from a single hole in the roof space of the Clocktower Café. Following the Bat Mitigation Guidelines this roost is classified as being a maternity roost for *Plecotus* bats. The conservation significance of this roost is considered to be important at the District level.

4.2 However, no bats were recorded emerging from the Clocktower Café in June and were neither recorded on the static detectors or during the emergence survey undertaken in July. Given the close proximity of known brown long-eared bat roosts, approximately 70m south and 75m south-west of Site, this could suggest that the Clocktower Café is a satellite maternity roost for another, potentially larger maternity colony within the Leonardslee Estate or could be a maternity colony gathering ahead of a move to their preferred maternity roost. Given the species roost faithfulness, it is likely that the roost would be used throughout the year and not just during the maternity season.

4.3 The July survey of the Red House recorded a single unidentified bat emerging from beneath a hanging tile on the eastern-most elevation of the adjoining residential building, outside of the proposed works area. It is not possible to classify this roost at this stage, and therefore the roosts significance, given the lack of surveys undertaken on this area of the building. It is not known if there is direct connectivity between the location of the roost within the adjoining building and the proposed works area.

4.4 Although no Pipistrelle bats were recorded emerging from any of the buildings during the emergence surveys, the observations before sunset and within

15minutes after sunset of Pipistrelle bats commuting and/or foraging around Site, suggest that theses individuals may have emerged from within the known Pipistrelle roost within 100m of all three Sites.

Foraging and commuting habitats

4.5 Following the results of the observed behaviour on Site, the Site provides a resource for foraging for three species of bat: common pipistrelle, soprano pipistrelle and serotine, with suitable foraging habitat within the areas of woodland to the east of the Clocktower Cafe and residential garden spaces of Honey Cottage and Red House. Although a maternity roost for brown long-eared bats was recorded on Site, the Site and the habitats contained within them are not considered to provide a Core Sustenance Zone (CSZ) for Noctule bats, Serotine bats and bats within both the *Plecotus* and *Myotis* genus given the limited number of passes and behaviour recorded of these species on Site. This could be due to the small-scale habitats within the development boundary itself and the Sites direct connectivity to higher-quality habitats within the wider Leonardslee Estate, see Figure 1 in Appendix 1.

4.6 Brown long-eared bats are common and widespread; found throughout the UK, except north and north-west Scotland, with pre-breeding population estimates for Great Britain of around 200,000 (Harris and Yalden, 2008). This species is believed to be relatively abundant and widespread in Sussex and are associated with open woodland and parkland. Therefore, foraging activity may be occurring off-site within the wider Leonardslee Estate.

4.7 The habitats on Site could be considered part of the CSZ for the small number of common pipistrelle and soprano pipistrelle bats located both within known and unknown roosts within 2km of the Site. This is reflected in the numerous recordings of foraging behaviour with some observations falling within the typical emergence times of these species and continuing throughout the survey.

SUMMARY OF THE SITES IMPORTANCE FOR BATS

4.8 The Site is assessed as important for roosting bats at District level and important at Site level for foraging bats in accordance with the Bat Mitigation Guidelines and Tables contained within Appendices 5 and 6 (Reason and Wray, 2023). This is due to the presence of a maternity roost for one widespread bat species alongside the supporting function that the habitats on the Site provide for at least five widespread species of bat; common pipistrelle, soprano pipistrelle, Noctule bat, Brown long-eared bat and bats within the Myotis genus and one rare or restricted distribution bat species; serotine bat, some of which are also SPI; Noctule, soprano pipistrelle and brown long-eared. The size and quality of the habitats on Site compared to those within the wider area and county of Sussex are considered relatively small; however, its function as a foraging resource and stepping stone linking to habitats of higher value within the wider landscape cannot be discounted.

IMPACT ASSESSMENT

4.9 All British species of bat are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). Under this legislation it is an offence to deliberately capture, kill a bat or disturb, damage or destroy a bat roost.

4.10 The current proposals will not directly impact, or permanently impact upon the brown long-eared maternity roost identified within the Clocktower Café, unclassified brown long-eared bat roost within Honey Cottage or the unclassified bat roost within the Red House and despite the removal of two trees on Site, the Site's accessibility for foraging and commuting bats will remain unchanged meaning a mitigation licence for the works is unnecessary. However, the development proposals, described in Paragraphs 1.13 to 1.16 above have the potential to temporarily and indirectly impact upon roosting bats within the Red House, Clocktower Café and Honey Cottage via noise and vibration during the construction phase only. This could result in the potential fragmentation and abandonment of any on Site roosts if not mitigated for.

4.11 No temporary indirect effects are perceived on foraging or commuting bats during the construction phase as works will be undertaken during daylight hours when bats are generally not active.

4.12 In accordance with the evaluation of the roosts and habitats stated above, the Site wide impact of the proposals to bats, their roosts and supporting habitats, although permanent, would not be considered significant.

5 Summary and Recommendations

SUMMARY

5.1 This section summarises the data gathered during the surveys and the likely impacts on bats, bat roosts and supporting habitats that are present on the site, as described in previous sections of this report.

5.2 This section summarises the data gathered during the surveys and the likely impacts on bats, bat roosts and supporting habitats that are present on the Site, as described in previous sections of this report.

5.3 The following key ecological findings have been identified:

- There is a maternity roost for brown long-eared bats within the Clocktower Café on Site with 12 individuals recorded emerging and 11 individuals recorded returning to roost. The conservation significance of this roost is considered to be important at the District level. All bats were recorded emerging and re-entering from a single hole in the brickwork to the north-east of the clocktower during the survey undertaken in May 2024.
- No bats were recorded emerging from Honey Cottage during the dusk emergence surveys undertaken in 2024. However, Honey Cottage contains a confirmed roost for brown long-eared, with droppings found, and confirmed though eDNA within the roof void (Temple, 2024a).
- No bats were recorded emerging from the proposed works area within the Red House on Site. However, a single unidentified bat was seen emerging from the eastern most elevation of the adjoining house. It is not known if the roof void within the proposed works area has direct connectivity with the location of the bat emergence in the adjacent building.
- The proposed development includes the removal of shrubs and two trees within the woodland area to the east of the Clocktower Café to facilitate

building of a terrace. This could reduce the degree of suitable commuting and foraging habitat for bats on Site although this would be minor given the connectivity to woodland of a higher quality and larger area within the wider Leonardslee Estate.

- The Site and its connectivity to the wider landscape contains habitats which could support bat assemblages and could be considered part of the CSZ for the small number of common pipistrelle and soprano pipistrelle bats located both within known and unknown roosts within 2km of the Site.
- The Site is assessed as important for roosting bats at District level and important at Site level for foraging bats in accordance with Bat Mitigation Guidelines (Reason and Wray, 2023). This is due to the presence of a maternity roost for one widespread bat species alongside the supporting function that the habitats on the Site provide for at least five widespread species of bat and one rare or restricted distribution bat species some of which are SPI.
- Due to the predicted impacts of the development, further mitigation is required and further information on this is provided below.

RECOMMENDATIONS

MITIGATION & COMPENSATION

Roost sites

5.4 Due to the predicted temporary indirect impacts to the maternity roost within the Clocktower Cafe, a European Protected Species Mitigation (EPSM) licence is not considered necessary at this stage. Should the proposals change then the advice of a suitably qualified Ecologist sought. Where impacts are expected to impact the roost then a full EPSM licence may be required and obtained from Natural England prior to works to provide a derogation from the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act (1981) as amended.

5.5 In line with the perceived level of temporary indirect impacts to the brown long-eared bat roosts within the Clocktower Café and Honey Cottage and the possibility of bat presence within the Red House as it adjoins to a neighbouring building containing a common pipistrelle roost, it is recommended that works should proceed under a Precautionary Working Method Statement (PWMS). The PWMS should be produced ahead of works commencing and should include details on suitable timings for the works and identify which works should be overseen by an Ecological Clerk of Works (ECoW). An example of the timings for works which would be included within a PWMS has been given below in paragraphs 5.7 – 5.9 to allow an appropriate schedule of works to be drawn up.

5.6 The roost identified within the house adjoining the Red House is outside of the proposed working area. It is unknown if the roof void within the Red House has internal access with the location of this roost however, current proposals will not restrict or change the current level of internal access during or post development. The addition of roofing insulation within Office 1 will not significantly alter the existing thermal conditions within the roof void given the roof void already has some level of insulation and the proposals include a minor upgrade to this. Furthermore, Office 2, which adjoins to Office 1 along the western elevation, already contains the correct level of insulation so the thermal conditions associated with the increased insulation are already present on Site.

Timing

5.7 Due to roost faithfulness, it is likley that bats within the Plecotus genus would be present within the Clocktower Cafe and the Red House year round. Therefore, the works to both Honey Cottage and the Clocktower Cafe should be undertaken during the bat active season, but avoiding the maternity season (April to August inclusive), and prior to hibernation season which is typically considered to extend between November and March inclusive, as the buildings are considered to have suitability to support hibernating bats (Temple, 2024a).

5.8 The works to the Red House can be undertaken at any time of the year as no summer roosts were recorded and the building is not considered to have suitability to support hibernating bats (Temple, 2024a).

Foraging and commuting habitat

5.9 The areas of woodland, scrub and garden space on Site are considered to provide suitable foraging and commuting habitat for bats in the local area and should be retained wherever possible, but particularly where these provide connectivity with suitable off-site habitat within the wider landscape and Leonardslee Estate. The development proposals indicate that a two non-native trees (T118 and T119) (Temple, 2024b) within the woodland to the east of the Clocktower Café will be removed to facilitate the development. These trees are not considered suitable for roosting bats and although they will be removed, connectivity between the maternity roost and the pocket of woodland on Site will not be severed and the area of woodland will continue to remain connected to parcels of woodland within the wider Leonardslee Estate.

5.10 Any unavoidable loss should be compensated for through appropriate wildlife planting with input from a suitably experienced ecologist to ensure that habitat connectivity is maintained, and that an appropriate mix of native species is used. Where points of connectivity are weakened, these should be mitigated for with in-fill planting using species of a local provenance.

5.11 Where compensatory planting occurs this could act as a noise and lighting buffer between the proposed café terrace and the pre-existing woodland on Site. In line with current national and local planning policy and the principle of Biodiversity Net Gain, measures should also aim to enhance the site's value for biodiversity as a result of the development. Outline enhancement recommendations are provided below.

Habitat protection

5.12 As the Site is situated within an area designated as 'Wood-Pasture and Parkland' Habitat of Principal Importance, and could contain trees that have suitability for roosting bats, best environmental practice measures should be implemented where appropriate and include (Temple, 2023):

- Avoidance of lighting woodland. Mounted lights should not light up the woodland nor any identified roosts or known foraging and commuting routes;
- The protection of retained trees in accordance with BS 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations; and,
- In conjunction with tree protection (above), the erection of Heras fencing around the development footprint boundary to protect habitats and restrict vehicle and pedestrian access.

Lighting scheme

5.13 Many bat species use habitat features such as hedgerows, areas of woodland and scrub and tree lines as commuting routes between roosts and foraging areas (Altringham, 2003). The areas of woodland and scrub on Site are features that are currently being utilised by local bats. Of the four species of bat and two groups of bat recorded on Site, more light sensitive species, bats within the Myotis and *Plecotus* genus have been recorded. Therefore, increasing levels of light at or near these habitat features, which are currently unlit is considered likely to have negative consequences for commuting and foraging bats and could indirectly impact roosting habits (Collins, 2016).

5.14 Research has found that bats are sensitive to artificial lighting and that excessive lighting can delay bats from emerging from roosts, thus potentially reducing the time available for foraging, as well as potentially causing bats to move away from suitable foraging areas or roost sites to less optimal areas (Jones, 2000). It has been demonstrated that certain bat species will not cross lines of streetlights, which disrupt bat flight paths and restrict access to suitable habitat (Stone et al., 2009

and Gunnell et al., 2012). Research and the professional opinion of leading experts suggests that lighting over 1 lux at night is likely to impact more light-sensitive bats (Stone, 2013; Fure, 2006).

5.15 A proposed lighting strategy has not been produced by the client but where lighting is proposed post-development a sensitive lighting scheme should be drawn up and evaluated against design strategies documented within the Bat Conservation Trust Landscape and Urban Design for Bats and Biodiversity (Gunnell et al., 2012) and Bats and Artificial Lighting in the UK (ILP, 2023). Considerations for a lighting scheme with respect to bats, should include the following to ensure that the roosts on Site, the roosting features and important commuting routes and foraging areas remain unimpacted during the construction and operational phases of development;

- The level of artificial lighting should be kept to a minimum;
- Where this does not conflict with health and safety and/or security requirements, the Site should be kept dark during peak bat activity periods (0 to 1.5 hours after sunset and 1.5 hours before sunrise);
- Lighting that is required for security or safety reasons should use a lamp of no greater than 2000 lumens (150 Watts) and should comprise sensor activated lamps;
- LED or low pressure sodium lights are a preferred option to high pressure sodium or mercury lamps;
- Warm-white (i.e. long wavelength) should be used over blue-white (i.e. short wavelength) lights as the latter have a significant negative impact on bats (Stone, 2013);
- Lighting should be directed to where it is needed with minimal light spillage. This can be achieved by limiting the height of the lighting columns and by using as steep a downward angle as possible and/or a shield or hood that directs the light below the horizontal plane; and

- Artificial lighting should not directly illuminate any habitats of value to commuting/foraging bats such as the grassland and woodland to the west or trees assessed as having suitability for roosting bats.

5.16 The High Weald AONB Management Plan (2019) propose that public bodies and others 'follow the Institute for Lighting Professionals guidance; promote information on dark sky-friendly lighting; install outside lighting only when needed and use dark sky-friendly lighting' (objective OQ4) (High Weald Joint Advisory Committee 2019).

ENHANCEMENTS

5.17 Planning policy at the national and local level and strategic biodiversity partnerships encourage inclusion of ecological enhancements in development projects. Ecological enhancements can also contribute to green infrastructure and ecosystem services such as storm water attenuation. Measures set out below would be suitable for integration into the Site's design and can be used to aim to achieve a net gain in biodiversity, particularly for bats. Please note, however, that no formal calculations have been provided as this is outside the scope of this document.

Dark-sky friendly lighting

5.18 The High Weald AONB Management Plan (2019) propose that public bodies and others 'follow the Institute for Lighting Professionals guidance; promote information on dark sky-friendly lighting; install outside lighting only when needed and use dark sky-friendly lighting' (objective OQ4) (High Weald Joint Advisory Committee 2019).

5.19 Consideration should be given to a sensitive artificial lighting strategy during construction and post-development with respect to breeding birds, dormice and foraging and commuting bats. This could include specifications for downward facing lights or the inclusion of baffles with light spillage kept to a minimum. During the construction phase artificial lighting should only be utilised where necessary

for health and safety reasons with lighting only used for the period of time for which it is required (Jones, 2000).

Wildlife Planting

5.20 In order to provide enhancements with the aim of a net-gain in biodiversity, further planting in context within the setting of the Site and with wildlife value could be advantageous within the ownership boundary. Planting opportunities could include potted planters, planted trellis for climbing plant species and the use of hanging baskets. Whichever species are chosen, wildlife planting should include a diversity of native species of local provenance. The use of nectar-rich and berry producing plants will attract a wider range of insects and birds and will continue to accommodate those already accessing habitats on Site.

5.21 Any new or replacement tree planting should be under-planted to improve structure and cover for wildlife.

5.22 Good horticultural practice should be utilised, including the use of peat-free composts, green manure, mulches and soil conditioners, native plants with local provenance, and avoidance of the use of invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Provision of nesting opportunities

5.23 In order to enhance the Sites for bats, it is recommended that bat boxes are erected on suitably mature trees within the Site or wider Estate boundary to provide suitable nesting/ roosting features. It is recommended that bat boxes should include the following or similar where these are not available;

- 2F Schwegler standard bat boxes (or similar approved) (mounted on mature trees)
- 2FN Schwegler standard bat boxes (or similar approved) (mounted on mature trees)

5.24 Notwithstanding any requirements for a licence, roosting features for bats could be installed on trees within the areas of woodland on Site, or other trees within the wider Leonardslee Lakes and Gardens Estate or even on the side of Honey Cottage. A species-specific bat box should be chosen following the results of the required bat surveys (see the Preliminary Roost Assessment report, Temple, 2024a), however, consideration should also be given to Bechstein's bat, Barbastelle, brown long-eared and noctule bats which are primarily woodland species, and all UK BAP priority species.

5.25 Bat boxes can be sited on trees at a height of between 3m to 6m in an open sunny position. A group of 3 to 5 boxes facing in different directions will provide a variety of micro-habitats. Please note that once bats have inhabited a roost site they may only be disturbed by licensed bat workers.

5.26 Woodcrete/woodstone bat boxes (or equivalent sustainable material) are recommended as they are long lasting compared to wooden boxes, insulate occupants from extremes of temperature and condensation and are available in a broad range of designs.

References

British Standards Institution (BSI) (2013). *Biodiversity. Code of practice for planning and development: 42020*. BSI, London.

CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Version 1.2*. Chartered Institute of Ecology and Environmental Management, Winchester

CIEEM (2019) *Advice Note on the Lifespan of Ecological Reports and Surveys*. April 2019.

Collins, J. (ed.) (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition*). The Bat Conservation Trust, London.

Cowan, A. (2006) *Trees and Bats. Guidance Notes 1.* Arboricultural Association, Cheltenham.

Department for Levelling Up, Housing & Communities, (2023) National Planning Policy Framework. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

Fure, A. (2006). *Bats and lighting*. The London Naturalist

Gunnell, K., Grant, G. and Williams, C. 2012. *Landscape and urban design for bats and biodiversity*. Bat Conservation Trust

Institution of Lighting Professionals (2023) *Bats and Artificial Lighting in the UK*. Guidance Note 08/23. Institution of Lighting Professionals and Bat Conservation Trust https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting

Jones, J. (2000) *Impact of lighting on bats*. Bat Conservation Trust, London.

Middleton, N., Froud, A., and French, K (2014) *Social Calls of the Bats of Britain and Ireland*, Exeter.

Ministry of Housing, Communities and Local Government (2019). *National Planning Policy Framework*. DCLG. London.

Reason, P.F. and Wray, S. (2023). *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats.* Chartered Institute of Ecology and Environmental Management, Ampfield.

Stone, E.L. (2013) *Bats and lighting: Overview of current evidence and mitigation*. University of Bristol.

Temple (2023) Stable Block, Leonardslee Lakes and Gardens Preliminary Ecological Appraisal and Preliminary Roost Assessment (PRA)

Temple (2024a) Potters Cottage, Offices, Honey Cottage & Red House, Leonardslee Lakes and Gardens, East Sussex Preliminary Roost Assessment (PRA)

Temple (2024b) Garden Entrance, Honey Cottage, Clock Tower Cafe and Village Centre, Leonardslee Lakes and Gardens, West Sussex, Preliminary Ecological Appraisal

Appendix 1: Survey Maps

Figure 1: Site Context

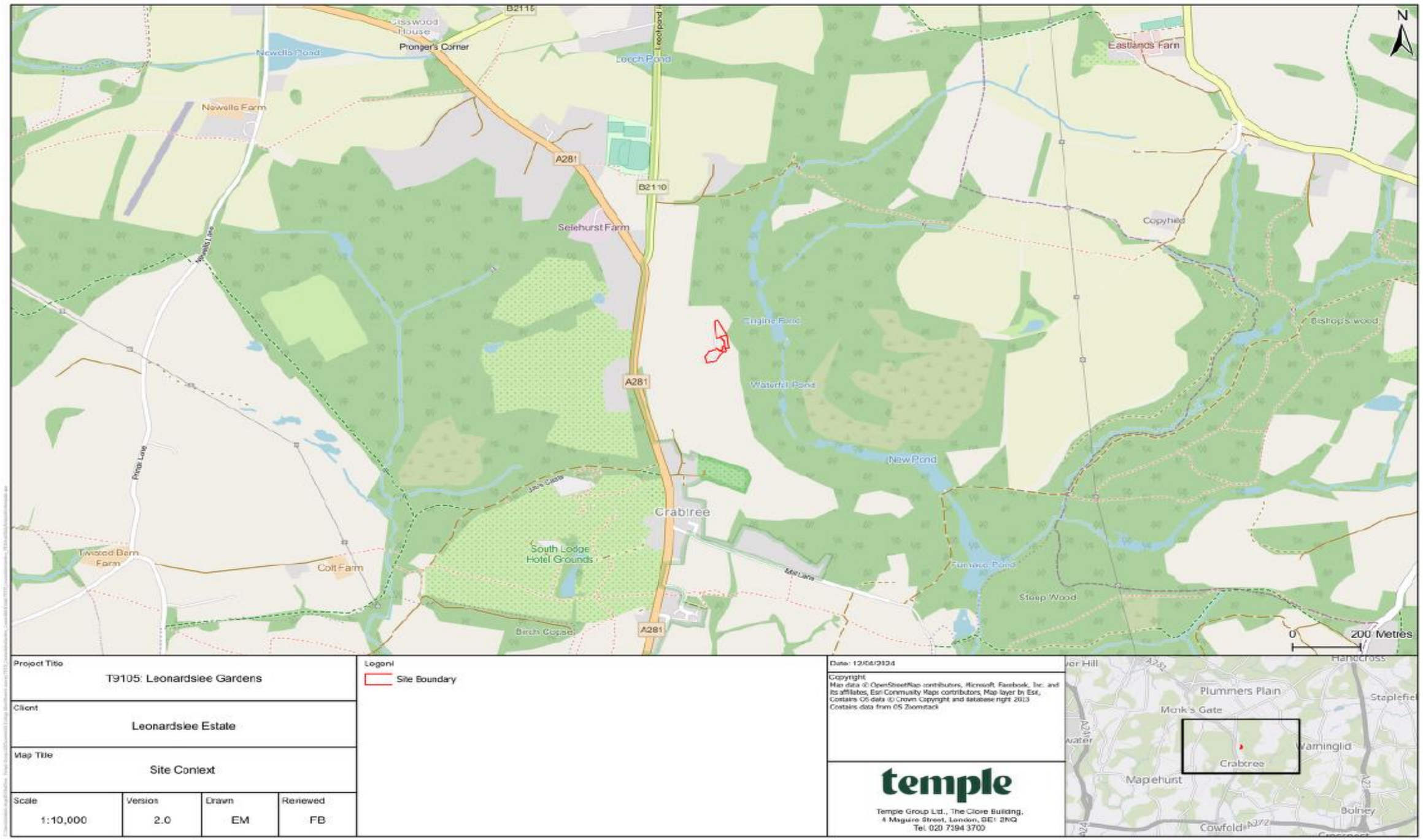

Figure 2: Local Designated Sites Map

Figure 3: Bat Dusk Emergence Survey 1 of 3, Honey Cottage, 13.05.2024

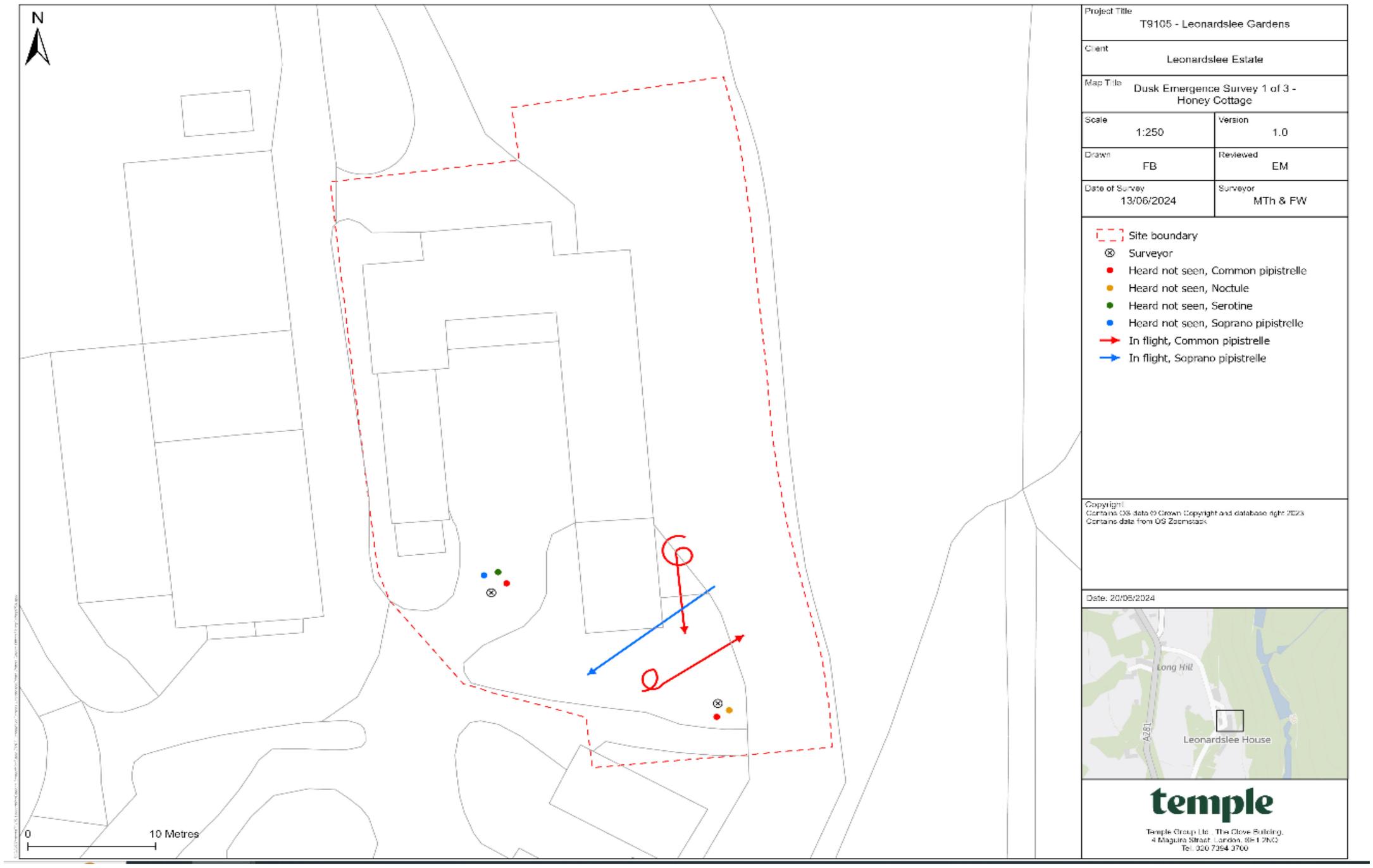

Figure 4: Bat Dusk Emergence Survey 1 of 3, Clocktower Café, 13.05.2024

Figure 5: Bat Dusk Emergence Survey 2 of 3, Honey Cottage, 12.06.2024

Figure 6: Bat Dusk Emergence Survey 1 of 2, Red House, 12.06.2024

Figure 7: Bat Dusk Emergence Survey 2 of 3, Clocktower Cafe, 17.06.2024

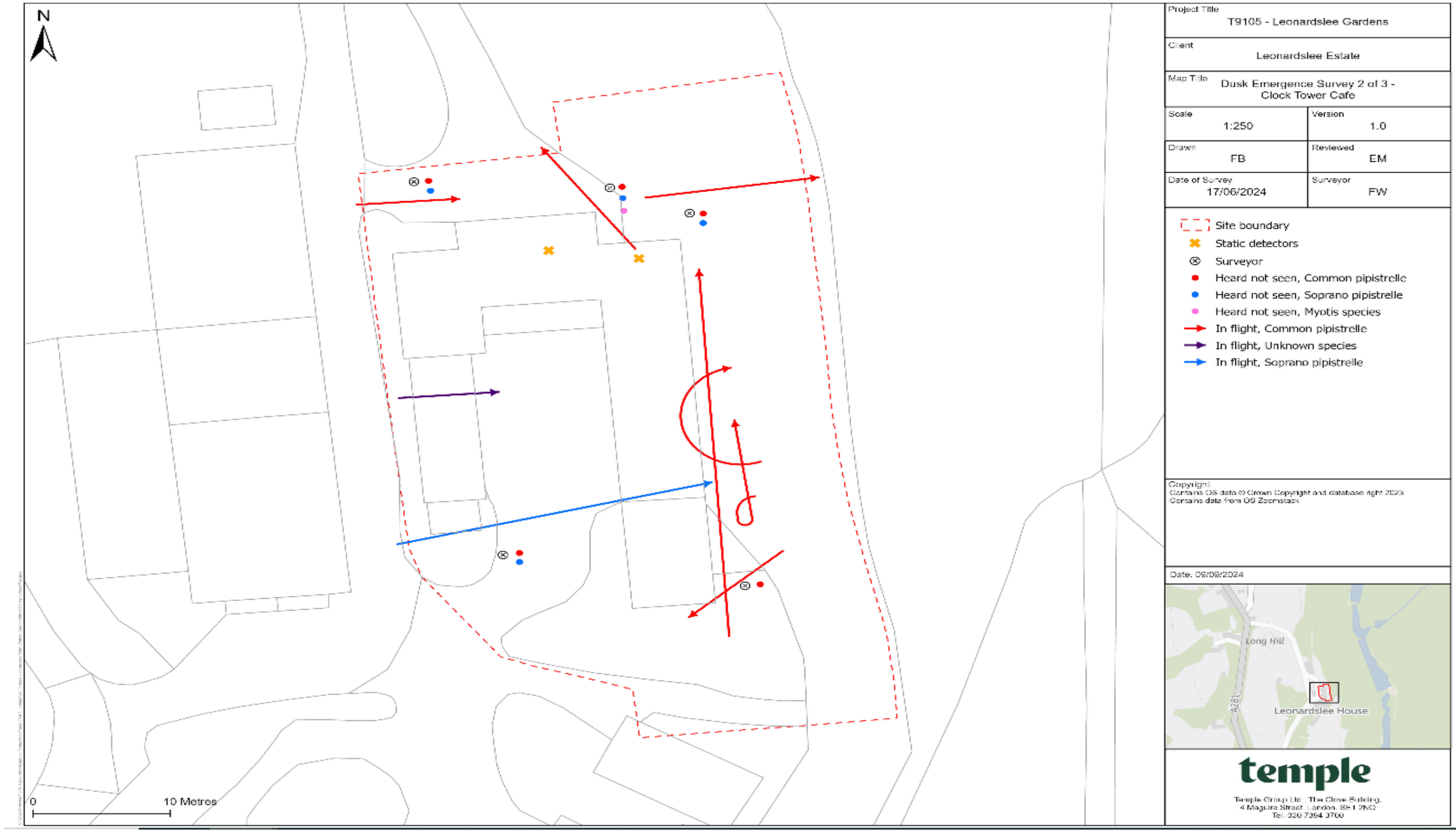

Figure 8: Bat Dusk Emergence Survey 2 of 2, Red House, 16.07.2024

Figure 9: Bat Dusk Emergence Survey 3 of 3, Honey Cottage, 17.07.2024

Figure 10: Bat Dusk Emergence Survey 3 of 3, Clocktower Cafe, 23.07.2024

Appendix 2: Typical Bat Emergence / Return times

Species common name	Mean or median emergence time in relation to sunset in minutes (m)	Standard deviation (range in which 95% of observations occurred in studies)
Greater horseshoe	May/June mean 28m after June median 25m after July mean 25m after	11-45m after No data (but earliest starting 19m after) 16-58m after
Lesser horseshoe	May/June mean 33m after June median 31m after July mean 21m after August mean 37m after	30-36m after No data (but earliest starting 19m after) 14-28m after 16-58m after
Alcathoe	Mean 1.1 before	16.4m before to 14.3m after
Bechstein's	Mean 47n after June median 33m after	No data (but actual range 2m before to 92m after) No data (but earliest starting 30m after)
Brandt's	Mean 43.3 minutes after May/June mean 27.3m after July mean 21.4m after August mean 24.9m after	No data 23.7-30.9m after 18-24.8m after 20.8-29m after
Daubenton's	May mean 46.1m after June mean 58.1m after July/August mean 43.1m after Lime kiln mean 28m after Trees mean 45m after	Non data (but actual range 17-94m after) Lime kiln 16-40m after Trees 34-56m after
Natterer's	June median 75m after Median 55.9m after July mean 31m after	No data (but earliest starting 31m after) 54.1-57.7m after 22-41.2m after
Whiskered	Mean 33.3m after Jubne median 32m after	No data (but earliest starting 28m after)
Leisler's	June median 18m after Mean 18.6m after Mean 19m after	No data (but earliest starting 3m after) 8.3-26.9m after No data (but actual range 23.4 before to 77.4m after)
Noctule	May & August median 7.6 after July median 0.2m before Mean 7m after Mean 11m after	0.1m before to 15.3m after 4.18m before to 4.58m after 16m before to 31m after No data (but actual range 7-26m after)
Common pipistrelle	Mean 24.8m after	6.9-42.7 after
Soprano pipistrelle	May/June mean 35m after July mean 27m after August mean 29m after Mean 33.5m after	23-47m after 21-33m after 25-34 after 12-55m after
Nathusius' pipistrelle	Mean 30m after	Non data (but actual range 11-50m after)
Serotine	Mean 11.6m after	3.9-19.3m after
Barbastelle	Mean 24m after	17.1-30.9m after
Brown long-eared	June median 54m after Mean 61.7m after Mean 61m after	No data (but earliest starting 33m before) 57.4-66m after 28-94m after
Grey long-eared	Mean 36m after	20-52m after

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 Directive[4] 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.

[4] 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
- 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 favourable 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;
    - 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
- 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 roost[5].

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

Appendix 4: Rarity of Bat Species

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Table 1 Rarity Category

Rarity Category	South-west England & South Wales	Southern England	South-eastern/ East Anglia to The Wash	North/Mid Wales	Central England / Midlands	Northern England	Southern Scotland	Northern Scotland	Northern Ireland
Widespread	*Ppip* *Ppyg* *Paur*	*Ppip* *Ppyg* *Paur*	*Ppip* *Ppyg* *Paur*	*Ppip* *Ppyg* *Paur*	*Ppip* *Ppyg* *Paur*	*Ppip* *Ppyg* *Paur*	*Ppip* *Ppyg*	*Ppip* *Ppyg*	*Ppip* *Ppyg* *Paur*
Widespread in many geographies, but not as abundant in all	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	*Mdau* *Mnat* *Nnyc*	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	*Mdau* *Mnat* *Paur*	*Mdau* *Mnat* *Paur*	*Mdau* *Mnat* *Nlei* *Paur*
Rare or restricted distribution	*Rhip* *Eser* *Nlei* *Pnat*	*Malc* *Eser* *Nlie* *Pnat*	*Mmys* *Mbra* *Eser* *Nlei* *Pnat*	*Rhip*	*Eser* *Nlei* *Pnat*	*Malc* *Nlei* *Pnat*	*Mmys* *Nnyc* *Nlei* *Pnat*	*Pnat*	*Mmys* *Pnat*
Rarest Annex II Species and very rare	*Rfer* *Mbec* *Bbar* *Paus*	*Rfer* *Rhip* *Mbec* *Bbar* *Paus*	*Malc* *Bbar*	*Rfer* *Bbar* *Eser* *Nlei* *Pnat*	*Malc* *Bbar*		*Mbra*		

Appendix 5: Importance of Roosts

Table 1 Importance of Roosts

	Roost Category: note this relates to the valuation of a roost and does not mean that all such sites are 'places of shelter'						
Conservation status/distribution	Feeding perches Night roosts Individual or very small occasional /transitional / opportunistic roosts	Non-breeding day roosts (small numbers of species)	Mating sites (excluding individual trees and large swarming sites) Small numbers of hibernating bats	Larger transitional roosts	Hibernation sites	Autumn swarming sites (largely vesper sp. Which hibernate under ground	Maternity sites
Widespread all geographies	Site	Site	Site	Site/local	District / county (larger hibernation sites are rare in the UK)	District / county (very large pipistrelle swarming sites as yet unknown in the UK)	Unlikely to exceed District importance unless colonies are atypically large; importance increased for assemblages.
Widespread in many geographies but not abundant in all	Site	Site	Site, dependant on local distribution (for myotis see swarming column)	District	District / County importance dependent on size and number of species	County / Regional importance dependent on size, importance increased for larger sites that serve larger numbers / species	Unlikely to exceed County importance unless colonies are atypically large; importance increased for assemblages.
Rare or restricted distribution	Site (very well used night roosts may be of District importance for some species)	Site / Local / District dependent on local distribution	Site / Local / District dependent on local distribution	District	District / County importance dependent on size and local distribution.	County / Regional importance on size and local distribution. Increased value for assemblages	County / Regional importance on size and local distribution. Increased value for assemblages

					Increased value for assemblages		
Rarest Annex II species and very rare	Site (very well used night roosts may be of District importance for some species)	Site / Local / District dependent on local distribution	Site / Local / District dependent on local distribution	District	District / County importance dependent on size and local distribution. Increased value for assemblages	District / County importance dependent on size and local distribution. Increased value for assemblages	District / County importance dependent on size and local distribution. Increased value for assemblages

Appendix 6: Importance of bat assemblages

Table 1 and 2 Importance of bat assemblages

Rarity Category (points / Species)	South-west England to South Wales		Southern England		South-England / East Anglia to The Wash		North / Mid Wales		Central England / Midlands	
Widespread all geographies (Score* 1)	*Ppip* *Ppyg* *Paur*	Score 3	*Ppip* *Ppyg* *Paur*	Score 3	*Ppip* *Ppyg* *Paur*	Score 3	*Ppip* *Ppyg* *Paur*	Score 3	*Ppip* *Ppyg* *Paur*	Score 3
Widespread in many geographies but not abundant in all (Score 2)	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	Score 10	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	Score 10	*Mdau* *Mnat* *Nnyc*	Score 10	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	Score 10	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	Score 10
Rare or restricted distribution (Score 3)	*Rhip* *Eser* *Nlei* *Pnat*	Score 12	*Malc* *Eser* *Nlei* *Pnat*	Score 12	*Mmys* *Mbra* *Eser* *Nlei* *Pnat*	Score 15	*Rhip*	Score 3	*Eser* *Nlei* *Pnat*	Score 9
Rarest Annex II species and very rare (Score 4)	*Rfer* *Mbec* *Bbar* *Paus*	Score 16	*Rfer* *Rhip* *Mbec* *Bbar* *Paus*	Score 20	*Bbar*	Score 4				
Thresholds	Maximum Possible	41	Maximum Possible	45	Maximum Possible	28	Maximum Possible	36	Maximum Possible	26
County Importance Threshold: 45%	County	18	County	20	County	13	County	16	County	12
Regional Importance Threshold:	Regional	23	Regional	25	Regional	15	Regional	20	Regional	14
National Importance Threshold: 70%	National	29	National	22	National	20	National	25	National	18

*score per species present

Rarity Category (points / Species)	Northern England		Southern Scotland		Northern Scotland		Northern Ireland	
Widespread all geographies (Score 1)	*Ppip* *Ppyg* *Paur*	Score 3	*Ppip* *Ppyg*	Score 2	*Ppip* *Ppyg*	Score 2	*Ppip* *Ppyg* *Paur*	Score 3
Widespread in many geographies but not abundant in all (Score 2)	*Mmys* *Mbra* *Mdau* *Mnat* *Nnyc*	Score 10	*Mdau* *Mnat* *Paur*	Score 6	*Mdau* *Mnat* *Paur*	Score 6	*Mdau* *Mnat* *Nlei* *Paur*	Score 8
Rare or restricted distribution (Score 3)	*Malc* *Nlei* *Pnat*	Score 9	*Mmys* *Mnat* *Nlei* *Pnat*	Score 12	*Pnat*	Score 3	*Mmys* *Pnat*	Score 6
Rarest Annex II species and very rare (Score 4)			*Mbra*	Score 4				
Thresholds	Maximum Possible	22	Maximum Possible	24	Maximum Possible	11	Maximum Possible	17
County Importance Threshold: 45%	County	10	County	11	County	5	County	8
Regional Importance Threshold:	Regional	12	Regional	13	Regional	6	Regional	9
National Importance Threshold: 70%	National	15	National	17	National	8	National	12

Appendix 7: Standard Guidance for Mitigation, Compensation and Enhancement

Bat tubes, bat bricks and bat boxes

To compensate for the loss of roosts used by crevice dwelling species or to provide enhancement measures thought should be given to utilising proprietary products from recognised manufacturers such as: Bird Brick Houses, The Nest Box Company, Schwegler, Habibat, Causa and Vincent. Bat tubes and integrated bat bricks are artificial roost features that can be incorporated into building structures. Bat boxes are generally fitted externally to mature trees or structures. The site's value to bats could be enhanced by installing any of these features. Any bat tubes and bat bricks used for enhancement would need to be in addition to any required to compensate for the loss of the roosts.

Bat tubes, bat bricks or bat boxes should be located at least 5m above ground level facing southeast – southwest and to allow for clear flight paths and should not be directly lit by artificial lighting. Bat boxes should be woodcrete designs as they are long lasting compared to wooden boxes and insulate occupants from extremes of temperature and condensation.

Bats and Lighting

Night-time lighting affects different bat species to varying degrees with certain species such as brown long-eared bats and myotis species being particularly sensitive to artificial illumination. Excessive and/or poorly directed lighting may delay bats in emerging from their roosts; shortening the time available for foraging, as well as causing bats to move away from favoured foraging grounds and drinking resources, movement corridors or roosting sites to alternative, and potentially sub-optimal darker areas (Jones, 2000). Artificial lighting is also thought to increase the chance of predation, as many avian predators will hunt bats (Institution of Lighting Professionals, 2018).

To minimise indirect impacts from lighting associated with new developments it is recommended that artificial lighting is only directed where necessary for health and safety reasons. Lighting should not illuminate any features of value to bats, including newly created, suspected or confirmed bat roosting sites and habitats of value to foraging and commuting bats. Habitats which are likely to support bats, and which could be affected by lighting include woodland, mature trees, hedgerows, scrub, ponds, lakes, ditches, streams, canals, rivers, rough grassland and buildings with suitability to support roosting

bats. Lighting should only be used for the period of time for which it is required (Jones, 2000).

This can be achieved by following accepted best practice (Fure, 2006; Bat Conservation Trust 2011; Stone 2013; Institution of Lighting Professionals, 2018):

- Where appropriate, professional lighting designers should be consulted, and the need for quantitative lighting measurements should be considered;
- Lighting mitigation should be based on robust baseline surveys of bat behaviour and existing light levels on site wherever possible;
- The level of artificial lighting including flood lighting should be kept to an absolute minimum;
- Where this does not conflict with health and safety and/or security requirements, the site should be kept dark during peak bat activity periods (0 to 1.5 hours after sunset and 1.5 hours before sunrise);
- Variable lighting regimes (VLR) can be utilised to lower lighting levels during periods of low human activity (e.g. 00:30-05:30);
- Lighting required for security or safety reasons should use a lamp of no greater than 2000 lumens (150 Watts) and should comprise sensor-activated lamps;
- Use narrow-spectrum light sources that peak higher than 550 nanometres, avoiding lights with UV, white and blue wavelengths;
- Lights utilising LED technology are the preferred option as these lights do not emit on the UV spectrum, are easily controllable in terms of direction/spill and can be turned on and off instantly;
- A 'warm white' spectrum LED light (ideally <2700 Kelvin) should be used over 'cool white' to reduce blue light component;
- Avoid the use of sodium or metal halide lamps, these gas lamps require a lengthy period in which to turn off and the diffuse nature of the light emitted makes light spillage a significant problem.
- Lights required for night time deliveries or security patrols could be set to activate with pressure activated sensors set into the ground;

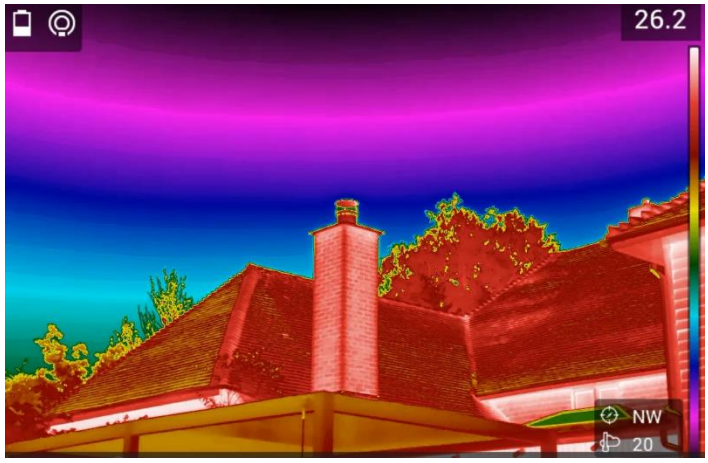
- Lighting should be directed to where it is needed to minimise light spillage. This can be achieved by limiting the height of the lighting columns and by using as steep a downward angle as possible and/or a shield/hood/cowl/baffle/louvre that directs the light below the horizontal plane and restricts the lit area;
- Usually using lower lighting columns and increasing the spacing between them reduces light intensity and spill;
- Plant vegetation to form light barriers and dark corridors. Use close-boarded fencing to screen light until vegetation matures. Dark corridors should be well connected to commuting routes;
- Artificial lighting should not directly illuminate any confirmed or potential bat roosting features or habitats of value to commuting/foraging bats. Similarly, any newly planted linear features or compensatory bat roosting features should not be lit;
- The use of reflective surfaces under lights should be avoided;
- Consider the use of 'smart glass' or automatic blinds where windows and glass facades cannot be avoided; and
- Create new habitat as alternative bat flightpaths if the effects of light cannot be properly mitigated for.

Appendix 8: NVA Screenshot

Photograph 1: Honey Cottage, south and east elevations. View looking north using thermal imaging camera.

Photograph 2: Honey Cottage, west elevation. View looking east using infra-red camera.

Photograph 3: Red House, southern elevation. View looking north-west using thermal imaging camera.



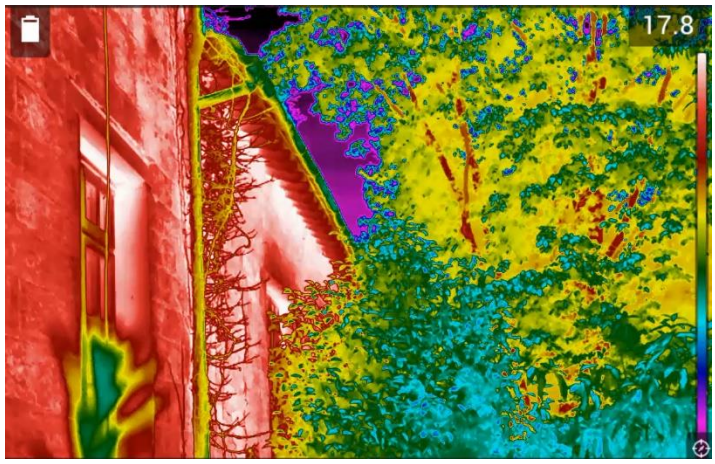
Photograph 4: Red House, western elevation. View looking north-east using an infra-red camera. Vegetation growth clear in the image.

Photograph 5: Red House, north and east elevations. View looking south using an infra-red camera.

Photograph 6: Clocktower Café, eastern elevation. View looking south-west using an infra-red camera.

Photograph 7: Clocktower Café, northern elevation. View looking south using an infra-red camera.

Photograph 8: Clocktower Café, eastern elevation with woodland to the east. View looking north using a thermal imaging camera.

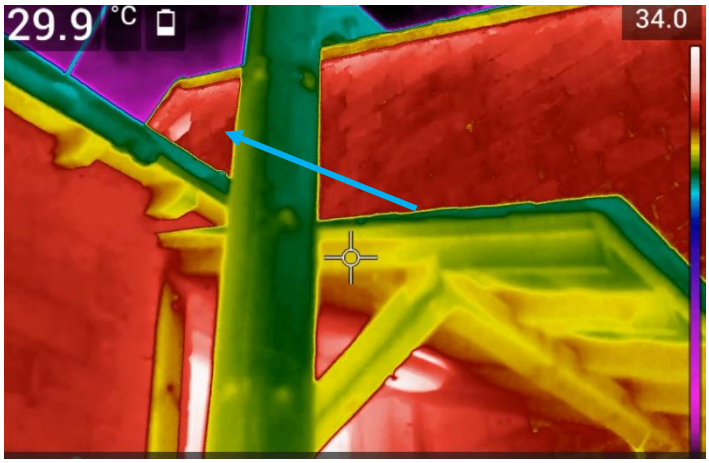


Photograph 9: Clocktower Café, south and west elevations of the café. View looking north using an infra-red camera.

Photograph 10: Clocktower Café, southern elevation of café. View looking north using a thermal imaging camera.

Photograph 11: Clocktower Café, eastern elevation. View looking west using a thermal imaging camera.

Photograph 12: Clocktower Café, western elevation. View looking west using infra-red camera. Blue arrow shows location of bat emergences.



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