URBAN EDGE ENVIRONMENTAL CONSULTING

NATURAL PROGRESSION

Land at Burleigh Lane, Crawley Down, West Sussex

Protected Species Report

December 2023

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Protected Species Report

Client:	Merrow Wood	
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Abbreviations

ARS	Artificial Refuge Surveys
BCT	Bat Conservation Trust
BPPH	Bat Passes per Hour
ECoW	Ecological Clerk of Works
GCN	Great Crested Newt
NERC	Natural Environment and Rural Communities Act 2006
PCR	Polymerase Chain Reaction
PEA	Preliminary Ecological Appraisal
PRF	Potential Roost Features
SAC	Special Area of Conservation
SSSI	Site of Special Scientific Interest
TN	Target Note
TP	Transect Point
WCA	Wildlife and Countryside Act 1981 (as amended)
VES	Visual Encounter Surveys

0 Executive Summary

0.1 Introduction

0.1.1 Protected species surveys for great crested newt, foraging and commuting bats, hazel dormouse and reptiles were undertaken for the site of a proposed residential development at Land at Burleigh Lane, Crawley Down, West Sussex. The study was undertaken to identify and evaluate the potential impacts of development on protected species and make recommendations accordingly.

0.2 Results

0.2.1 Nine ponds identified within 250m of the survey area boundary were subject to eDNA sampling for great crested newts. Ponds P21 and P22 returned a positive result for GCN eDNA. Ponds P2, P4, P5 and P7 were negative for GCN eDNA. No access was granted to P1, P3 was dry at the time of survey and no pond was present at the location of P6. No GCN were recorded under reptile refugia during the reptile survey.

0.2.2 Species diversity recorded during the bat activity surveys included at least eight species. The data show that the majority (204.01 BPPH or 91.34%) of all bat calls recorded were from *Pipistrellus spp.* bats, with the sum of BPPH registered at each location being 195.54 BPPH or 87.55% for common pipistrelle, 8.17 BPPH or 3.66% for soprano pipistrelle, and 0.30 BPPH or 0.13% for Nathusius' pipistrelle. Of the remaining bat passes, *Myotis spp.* (15.45 BPPH or 6.92%) were the next most frequently recorded, followed by brown long-eared (3.12 BPPH or 1.40%), noctule (0.59 BPPH or 0.26%), serotine (0.16 BPPH or 0.07%) and finally Leisler's bat (0.02 BPPH or 0.01%). These results are broadly consistent with those recorded during the transect surveys.

0.2.3 No evidence of hazel dormouse was recorded during the course of the survey period. The survey findings confirm that hazel dormouse is absent from the survey area.

0.2.4 The Visual Encounter Surveys and Artificial Refuge Surveys recorded a total of one grass snake across the survey period. The record was toward the centre of the northern boundary.

0.3 Evaluation

0.3.1 In the absence of survey data for populations of GCN within ponds on and adjacent to site, it is difficult to assign precise importance. Accordingly, the survey area is considered to be of Local-District Importance for GCN. Without mitigation, the Proposed Development is likely to result in destruction of great crested newt habitat or present a risk of killing, injury or disturbance for individuals if present during the works, which would constitute an offence under the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017).

0.3.2 The site is predominately used by a high proportion of common and widespread bat species with variable levels of activity recorded and is considered to be of Local Importance for its bat population. The Proposed Development will result in a permanent loss of up to c.2.64ha of neutral grassland, bramble scrub, mixed scrub and woodland across the survey area. Boundary habitats are expected to be retained excluding a new vehicle access route at the north-western corner which is expected to result in the loss of c.6-10m of an existing line of trees. Providing other boundary habitat remain intact, no significant negative impact to foraging and commuting bats is foreseen from the small loss of habitat in the north-western corner.

0.3.3 The impact of light on foraging and commuting bats is classified as low for serotine and individuals of the genera *Nyctalus* and *Pipistrellus* – which comprise 91.69% of all bats recorded during passive monitoring at the site. These species are unlikely to be significantly affected by proposals for the site. Light intolerant species recorded at the site, including brown long-eared and individuals of the genera *Myotis*, together comprised 8.31% of activity recorded during passive monitoring. Use of the site by these species may be reduced by the proposals, but it is likely that the development can be accommodated without adverse effects on the conservation status of local bat populations within their natural range. These species are often associated with woodland habitats, which are located offsite and will be protected as part of proposals.

0.3.4 There were no observations of hazel dormouse, or signs of their presence such as nests, gnawed nuts or droppings, during the course of the 2023 survey period. The survey findings provide a good level of confidence that hazel dormouse is likely to be absent from the site. The survey area is considered to be of Negligible Importance for hazel dormouse and no impacts to hazel dormouse are anticipated as a result of the Proposed Development.

0.3.5 The survey findings indicate that a low population of grass snake was present within the survey area during the 2023 survey season. The survey area achieves a site score of 1 and does not meet the criteria for a Key Reptile Site (as detailed in Table 2.6). The Proposed Development is not anticipated to impact the local status of grass snake and therefore the survey area is considered to be of Negligible Importance for its reptile population. Without mitigation, the Proposed Development is likely to result in a risk of killing / injury of individual reptiles if present during the works, which would constitute an offence under the Wildlife and Countryside Act 1981 (as amended). Measures to avoid and mitigate predicted impacts upon reptiles are recommended.

0.4 Recommendations

0.4.1 Recommendations are made below for avoidance and / or mitigation of impacts to protected species to prevent an offence under the relevant legislation from occurring, and to reduce the risk of development proposals resulting in significant effects on the population and distribution of species recorded during the surveys; these are summarised in Table 0.1. Recommendations are also provided for ecological protection and enhancement. The recommendations should be read alongside those contained in the Preliminary Ecological Appraisal which continue to apply.

Table 0.1: Summary of recommendations

#	Recommended mitigation, avoidance and enhancement measures
R1	If a conventional Mitigation Licence is preferred for GCN, population estimate surveys will be required for ponds within 250m of the survey area from mid-March to mid-June, together with presence/absence (eDNA) data for ponds 250-500m from the site. Alternatively, the Proposed Development can join the District Level Licensing scheme for West Sussex.
R2	Negative impacts on foraging and commuting bats and other nocturnal species will be avoided, during both construction and operation of the Proposed Development, by preparing a lighting strategy to avoid light spill falling onto retained habitats.
R3	A translocation of reptiles from the construction zone to a suitable receptor site will be undertaken prior to site preparation and commencement of works, to avoid the risk of killing / injury to reptiles.
#	**Recommended ecological protection measures**
R4	Removal of nesting bird habitats (including vegetation and buildings) will be undertaken outside of the bird nesting season, which runs from 1 March to 31 August. It will therefore be carried out between September and February, but should be planned and implemented in accordance with the recommendations above.
R5	Hoardings / tree protection fencing will be installed at the construction zone perimeter for the duration of the works to protect the boundary hedgerows and offsite woodland from temporary impacts including noise, light and dust pollution. The exact location of hoarding will be led by the root protection zones of surrounding trees, to be confirmed by the arboricultural report for the survey area.
R6	Standard site procedures to prevent impacts on trees will be adhered to during construction.
R7	Small access gaps will be provisioned at the base of new fence boundaries to enable continued dispersal of small mammals across the site.
#	**Recommended ecological enhancement measures**
R8	Buffers of less intensively managed vegetation (e.g. coarse grasses and wildflowers) will be created within soft landscaped areas to maintain / enhance ecological connectivity.
R9	Hedgerow creation and / or restoration will use a range of native fruit, seed, nut and nectar-bearing shrub species appropriate to the location.
R10	Habitat piles for amphibians, invertebrates and reptiles will be created within areas at the edges of the survey area close to retained and other newly created habitats.
R11	The value of the survey area for birds will be enhanced by installing a range of artificial nest boxes onto new buildings and retained trees.
R12	The value of the survey area for bats will be enhanced by installing a range of artificial roost boxes onto new buildings and retained trees.

0.5 Conclusion

0.5.1 In the absence of mitigation, the Proposed Development will result in negative impacts to GCN, foraging and commuting bats and reptiles. However, mitigation measures are recommended to

prevent an offence under the relevant legislation from occurring, and to avoid / reduce the risk of development proposals resulting in significant effects on the populations of species recorded.

1 Introduction

1.1 Purpose of this Report

1.1.1 A Preliminary Ecological Appraisal (PEA) was carried out in February 2021 by Ethos Environmental Planning (Ethos, 2021) for the site of a proposed residential development at Land at Burleigh Lane, Crawley Down, West Sussex (Grid Reference: TQ 35046 37254). It was recommended that further surveys should be carried out for great crested newt (GCN) *Triturus cristatus*, badger *Meles meles*, foraging / commuting bats, hazel dormouse *Muscardinus avellanarius* and reptiles due to the presence of favourable habitats.

1.1.2 As badgers and their setts can suffer from persecution, all information relating to badger at the survey area is contained within a separate confidential report (UEEC, 2023).

1.2 Objectives and Approach of the Study

1.2.1 The study was commissioned to fulfil the following objectives:

- To determine the presence or likely absence of GCN, hazel dormouse, and reptiles, and if present record their distribution within the survey area;
- To identify features of importance for foraging and commuting bats, record the species assemblage, their conservation status, and assess the relative abundance of these species within the survey area;
- To provide sufficient data to inform a European Protected Species Mitigation Licence applications for hazel dormouse, if required;
- To identify and evaluate the potential impacts of development on GCN, foraging and commuting bats, hazel dormouse and reptiles; and
- To outline the measures required for avoiding and mitigating negative impacts to protected species and make recommendations for ecological enhancement.

1.2.2 To meet these objectives the survey approach involved field surveys using standard techniques to record the presence, distribution and relative abundance of target species within the survey area, with reference to current industry guidelines.

1.3 Survey Area

1.3.1 The Application Site boundary is expected to be the same as the survey area boundary.

1.3.2 The survey area lies at the southern edge of the village of Crawley Down in the Mid Sussex District of West Sussex. The survey area comprises c.2.64ha of partially land, currently dominated by grasslands with scrub, woodland, hedgerows and derelict buildings.

1.3.3 The survey area is bounded to the north, east and west by mature hedgerow and residential properties, and to the south by mature hedgerow and agricultural land. The extent of the Application Site and survey area are outlined on Figure 1.1.

1.3.4 The wider landscape is characterised by a patchwork of arable land and pasture with a network of drainage ditches, scattered ponds, hedgerows with trees and woodland blocks. A total of 22 ponds are present within 500m of the survey area.

1.4 Proposed Construction Activities

1.4.1 Planning consent is being sought for a residential development with vehicular and pedestrian access; car parking; open space and landscaping. The illustrative masterplan is shown in Figure 1.2.

Burleigh Lane, Crawley Down, West Sussex

Survey area

Figure 1.1: Survey area

0 100 200

Metres

N

Scale (at A4): 1:4,000 **Created by:** EM

Date: Dec 2023 **Reviewed by:** NP

Drawing number:

UE0604ECO-BurleighLane_SiteLocation_231220

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Figure 1.2: Proposed site plan

2 Survey Methodology

2.1 Great Crested Newt

eDNA survey

2.1.1 Access to all ponds located within 250m of the survey area (P1, P2, P3, P4, P5, P6, P7, P21 and P22) was requested to carry out an eDNA survey. See Appendix I for pond locations.

2.1.2 The objective of the survey was to establish the presence or likely absence of GCN from potentially suitable breeding ponds. The eDNA water sampling followed the methodology set out in Natural England's '*Technical advice note for field and laboratory sampling of GCN environmental DNA*' (Biggs *et al.*, 2014), which is provided as an appendix of the research report published by Defra into environmental DNA testing for GCN. This is the only methodology currently accepted by Natural England for this technique.

2.1.3 A single visit to each pond was made on 28 June 2023. At the time of the survey, the following information was collected for the pond:

- Site name;
- Nearest settlement;
- County;
- Time between receipt of sampling kit and date of sampling;
- Date of sampling;
- Personnel collecting sample;
- Ordnance Survey grid reference (12 figures);
- Percentage of pond perimeter that is accessible for survey;
- Data on inflows, and whether these were wet or dry at the time of survey;
- Data on presence and number of GCNs recorded during the survey (if any); and
- Information on any difficulties experienced during sample collection.

2.1.4 The following methodology for the sampling procedure for eDNA analysis was applied in the field in accordance with the survey protocol (Biggs *et al.*, 2014):

- During the survey, 20 samples of 30ml each were taken from around the perimeter of the pond, as equally spaced as possible. The locations of the samples were chosen to sample the entire margin with specific effort made to target areas where there may be newt egg laying and / or displaying activities.

- The sample ladle was stirred gently in the pond before the sample was retrieved in order to mix the water column, with care being taken not to stir up the sediment.
- All 20 samples were emptied as they were collected into a Whirl-Pack bag, which was then sealed and shaken for 10 seconds to mix the samples.
- Upon mixing, and using a sterile pipette, exactly 15ml of the sample was transferred from the Whirl-Pack bag into each of the six sterile tubes, which contained 35ml of ethanol. The sample was stirred between filling each tube to homogenize the water.
- Once filled to 50ml, each tube was mixed for 10 seconds to mix the sample and preservative Date of sampling.
- Samples were returned to the office and either dispatched at ambient temperature immediately for analysis or stored at 2-4°C in a refrigerator dedicated for this purpose.

2.1.5 The following precautions were adhered to, which ensured that no cross-contamination of samples occurred:

- Sterile gloves were worn by all surveyors at all times during the sampling process; and
- Samples were collected without the surveyor entering the water (i.e. the surveyors stood on the pond bank or edge).

2.1.6 The laboratory used for analysis of the samples was NatureMetrics, 1 Occam Court, Surrey Research Park, Guildford, GU2 7HJ, United Kingdom, which is participating in Natural England's proficiency testing scheme. Water samples were stored in refrigerated conditions and returned to the laboratory on 6 July 2023 via a 24hr courier service.

Evaluation criteria

2.1.7 A positive result means that GCNs are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

2.1.8 A negative result means that GCN DNA was not detected and GCN are likely to be absent from the waterbody.

2.1.9 On rare occasions an inconclusive result is issued. This occurs where GCN DNA has not been detected but the controls have indicated that the sample has been degraded or the polymerase chain reaction (PCR) inhibited in some way. This may be due to undefined components in the water chemistry or may be due to the presence of high levels of sediment or algae in the sample. A re-test could be performed but a fresh sample would need to be obtained, and if water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

2.1.10 Sediment content of each sample is visually recorded in the lab and reported on the results document. Inhibition and degradation results are also noted. If the result is recorded as evidence of decay (meaning that the degradation control was outside of accepted limits) or evidence of residual inhibition (meaning that the PCR reaction was inhibited) any negative result is recorded as indeterminate.

Limitations

2.1.11 No access was granted to pond P1 as it lay on private land. Pond P3 was found to be dry at the time of survey and is assumed to remain dry for the majority of the GCN breeding period. Pond P6 was shown on the map but no longer existed.

2.2 Foraging and Commuting Bats

2.2.1 Bat activity surveys were based on standard industry guidelines (Collins (ed.), 2016) and Natural England's standing advice[1] for bats, comprising:

- Transect surveys: walking through a representative sample of the survey area's habitats to a predetermined route, to listen for, observe and record bats in flight away from their roosts using handheld bat detectors, noting bat activity and behaviour; and
- Remote monitoring: installation of automated detectors for a five-night period per deployment to remotely monitor bat activity in fixed locations within the survey area, with locations changing over the course of the season.

2.2.2 Guidelines at the time of survey (Collins (ed.), 2016) recommended reasonable levels of bat activity survey effort, based on overall habitat suitability; see Table 2.1. The PEA concluded that the mosaic of grassland, scrub and woodland were of high suitability for foraging and commuting bats, but that transects surveys would only be required between May and September and supplemented with two static detectors (Ethos, 2021).

Table 2.1: Recommended survey effort for bat activity surveys

Low suitability habitat	Moderate suitability habitat	High suitability habitat
One survey visit per season (spring/summer/autumn), and One static detector location per transect, monitored for five consecutive nights per season (30mins before sunset (SS) to 30mins after sunrise (SR) each night)	One survey visit per month (April to October), including at least one dusk & pre-dawn survey, and Two static detector locations per transect, each monitored for five consecutive nights per month (SS-30mins to SR+30mins)	Up to two survey visits per month (April to October), including at least one dusk and pre-dawn survey, and Three static detector locations per transect, each monitored for five consecutive nights per month (SS-30mins to SR+30mins)

Transect surveys

2.2.3 A transect route representative of the survey area's habitats and transitional zones was plotted and walked once during each survey. Start points were randomised and the direction of travel alternated to avoid crepuscular bias. One / two surveyors undertook each transect survey, and walked at a slow, consistent speed along the transect route, stopping for approximately 5-7 minutes at each transect point (TP) to listen for bats and record activity and behaviour (spot

[1] Natural England (2015): *Bats: surveys and mitigation for development projects.* Accessed online at: https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects

counts). Bat activity between TPs was also recorded where possible. The locations of TPs are shown in Appendix III, and these are referred to within the results.

2.2.4 Dusk activity surveys commenced at sunset and continued for approximately two hours, while dawn activity surveys commenced two hours prior to sunrise. Two hours was considered to be a sufficient length of time in which to adequately cover the survey area and to account for the species likely to be present in these habitats in Sussex.

2.2.5 Anabat Scout, Wildlife Acoustics Echo Meter Touch Pro 2, and BatLogger M2 full spectrum detectors were used during the transect surveys. Bat recordings were analysed using Kaleidoscope Pro (v5.6.3) software which enables evaluation of a range of echolocation call parameters to identify bats to genus or species level. Weather conditions were noted during each survey (minimum / maximum air temperatures, wind speed/direction, precipitation and cloud cover) and are reported in Table 2.2 and alongside the results in Appendix IV.

Table 2.2: Bat activity survey dates and weather conditions

Date (2023)	Time	Weather conditions
31 May	Dusk	11-13°C, 100% cloud cover, fresh breeze (Beaufort 5), no precipitation
28 June	Dusk	19-16°C, 90-100% cloud cover, calm (Beaufort 0), no precipitation
20 July	Dusk	19-17°C, 100% cloud cover, light air (Beaufort 1), no precipitation
23 August	Dusk	20-19°C, 90-100% cloud cover, calm (Beaufort 0), light to moderate rain showers occurred twice during the survey
11 September	Dusk	20-18°C, 20-50% cloud cover, calm (Beaufort 0), no precipitation
12 September	Dawn	16°C, 60-100% cloud cover, light breeze (Beaufort 2), no precipitation

Remote monitoring

2.2.6 Two Wildlife Acoustics SongMeter MiniBat full spectrum bat detectors were used for the automated monitoring. These were sited at a height of around 3–5m above ground level and left *in-situ* for at least 5 nights during each month of survey. Deployment locations were chosen systematically to achieve an even distribution across the survey area representative of its habitats where possible and are shown in Appendix III; these locations are referred to within the results.

2.2.7 The bat detector was set to record passes from 30 minutes before sunset to 30 minutes after sunrise to capture early emerging and late returning bats and this was standard for all surveys. Data from the recorder were analysed using Kaleidoscope Pro (v5.6.3) software.

2.2.8 Weather data for the survey period was obtained from the closest weather station using the timeanddate.com website (https://www.timeanddate.com) and is presented in Appendix V.

Evaluation criteria

2.2.9 The importance of commuting routes and foraging areas are evaluated as Negligible, Local, County, Regional or National, with reference to Table 3.3 in the *Bat Mitigation Guidelines* (Reason, P.F. and Wray, S. (2023)). This method takes into account relative levels of bat activity;

landscape context of the survey area; the species assemblage using a feature, their conservation status[3] and habitat preferences; and the importance of identified roosts. This process analyses the overall importance of the survey area, but also serves to identify which parts of the survey area are Important Ecological Features (IEF), and which may therefore be of importance to the conservation status of local bat populations. Interpretation of these terms and the accompanying data is, where appropriate, informed by professional judgement.

2.2.10 It should be noted that bat passes recorded during automated static monitoring were split to a maximum duration of 60 seconds and do not equate to numbers of individual bats. Bats will often repeatedly pass a detector when hunting along a linear feature such as a hedgerow or tree line, and there is no way to determine numbers of individuals from this data. The number of bat passes should instead be taken as an index of relative bat activity at a particular location within the site.

Limitations

2.2.11 The foraging and commuting bat surveys deviated from the recommended guidelines, which recommend surveys be carried out each month from April to October for sites of moderate suitability. Instead, surveys were carried out each month between April and September as was recommended in the PEA (Ethos, 2021).

2.2.12 Two periods of light to moderate rain occurred during the August transect survey. The second period was heavy enough that the survey had to be abandoned at 22:07. The survey lasted beyond the 2-hour recommended survey length, but the full survey route was not completed. TP1 and TP14 were not visited.

2.2.13 The surveys were undertaken in accordance with the Bat Conservation Trust's (BCT) recommended timings for activity surveys (Collins (ed.), 2016). There were no further difficulties in gaining access to the site to carry out the surveys. Weather conditions were generally good during the surveys and within acceptable parameters.

2.2.14 The surveys were completed with the assistance of bat detectors. All survey techniques are subject to bias, and bat detector surveys may under-record species with weak echolocation calls, such as long-eared bats *Plecotus spp*. However, these biases were considered when interpreting the results.

2.2.15 Any bats recorded were identified to species (where possible) and recorded on a field map. Many of the calls were heard without being seen due to the position of the bat and the lack of light. Some bat calls are variable and extremely similar between species. Where identification to species level was not possible (for example in the Myotis bat group), bats were identified to family level (e.g., *Myotis spp.*).

[3] With reference to Table 3.1: Rarity Category in *Bat Mitigation Guidelines* (Reason, P.F. and Wray, S. (2023).

2.3 Hazel Dormouse

2.3.1 A presence / absence survey for hazel dormouse was carried out, based on standard industry guidelines (Bright *et al.*, 2006) and Natural England's standing advice[4] for dormouse, comprising:

- Nest tube surveys: installation of artificial nest tubes within areas of suitable habitat which were subsequently checked for occupancy.

Nest tube survey

2.3.2 Nest tube surveys utilise a minimum of 50 tubes deployed at c.15-20m intervals in suitable habitat within and bordering the survey area, usually installed in spring and left *in situ* at least until September. Each tube is checked for dormice or their nests during the survey. The survey is required to achieve a minimum score of 20 against the index of detection probability outlined in Table 2.3.

Table 2.3: Index of detection probability for hazel dormice (if using 50 nest tubes)

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

2.3.3 The index is based on a deployment of 50 nest tubes as standard. Where a survey deploys nest tubes in lesser numbers the weighting score is amended accordingly, because this will affect the detectability of dormice. The present survey used 50 nest tubes, installed within scrub, hedgerow and woodland habitat on 31 May 2023. Nest tube checks were carried out monthly between June and November thereby achieving a total score of 20 and gives a good degree of confidence in the survey findings.

2.3.4 Nest tubes were positioned in areas of suitable habitat within and adjacent to the survey area, as shown on the plan at Appendix VI. The location of each nest tube was marked with survey tape to ensure that all tubes could be re-located during subsequent survey visits. The location of occupied tubes containing hazel dormice, or their nests, was recorded using GPS coordinates, together with the number of individuals and sex, weight and maturity data. Weather conditions were noted during each survey (air temperature, wind speed, precipitation and cloud cover) and are reported in Table 2.4.

4 Natural England (2015): Hazel or common dormice: surveys and mitigation for development projects. Accessed online at: https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects

Table 2.4: Hazel dormouse survey dates and weather conditions

Date (2023)	Weather conditions
28 June	21°C, 90% cloud cover, calm (Beaufort 0), no precipitation
26 July	20°C, 70% cloud cover, fresh breeze (Beaufort 5), no precipitation
18 August	24°C, 40% cloud cover, light breeze (Beaufort 2), no precipitation
20 September	19°C, 100% cloud cover, fresh breeze (Beaufort 5), no precipitation
10 October	12-13°C, 100% cloud cover, moderate breeze (Beaufort 4), light rain
22 November	7-8°C, 50% cloud cover, calm (Beaufort 0), no precipitation

Evaluation criteria

2.3.5 Population size is very difficult to evaluate as dormice live at low densities, even in the best habitats. In early summer there are typically only 3 to 5 (but sometimes up to 10) adults per hectare in deciduous and conifer woodland habitats. Results from the National Dormouse Monitoring Programme suggests an average of between 1.75 and 2.5 adults per hectare based on 83 sites in various habitats, with the lowest densities in the north of England (1993 to 2000 inclusive; Bright & Sanderson, pers. Comm., cited in Bright *et al.*, 2006). Across the country, including sub-optimal habitats, the average population density is estimated to be around 2.2 adults per hectare.

Limitations

2.3.6 The surveys were undertaken in accordance with recommended survey timings (Bright *et al.*, 2006). There were no difficulties in gaining access to the site to carry out the surveys.

2.4 Reptiles

2.4.1 A presence / likely absence survey for reptiles was carried out, based on standard industry guidelines (Hill *et al.*, 2005; Froglife, 1999; Gent and Gibson (eds.), 2003) and Natural England's standing advice[5] for reptiles, combining Visual Encounter Surveys (VES) and Artificial Refuge Surveys (ARS). A minimum of seven survey visits during suitable weather (principally an air temperature between 9 and 18°C, and in the absence of rain and strong wind) are required to establish the presence or likely absence of reptiles within the survey area.

2.4.2 In total, 70 artificial refuges were used within the survey area distributed across approximately 2.64ha focusing on the areas of most suitable habitat as shown on the plan at Appendix VII. Guidelines recommend that at least 10 refuges are used per hectare of land surveyed (refuge density during this survey = c.26.5/ha). To give reptiles time to locate and habituate to new refuges in their environment all mats were placed on 31 May 2023, 3 months prior to the start of the main survey period.

5 Natural England (2015): Reptiles: surveys and mitigation for development projects. Accessed online at: https://www.gov.uk/guidance/reptiles-protection-surveys-and-licences

2.4.3 The location of reptiles (including sloughed skins or eggs) was recorded using GPS coordinates, together with species counts, sex (when distinguishable) and maturity data. Weather conditions were noted during each survey (air temperature, cloud cover wind speed, precipitation and ground conditions) and are reported in Table 2.5.

Table 2.5: Reptile survey dates and weather conditions

Date (2023)	Timings	Weather conditions
30 August	08:30-10:00	14-15°C, 0% cloud cover, gentle breeze (Beaufort 3), no precipitation
1 September	09:00-10:00	18-19°C, 10% cloud cover, light air (Beaufort 1), no precipitation
4 September	08:10-08:50	18-19°C, 0% cloud cover, light air (Beaufort 1), no precipitation
6 September	08:40-09:20	18-19°C, 0% cloud cover, calm (Beaufort 0), no precipitation
13 September	09:50-10:35	17-18°C, 80% cloud cover, light breeze (Beaufort 2), no precipitation
19 September	09:00-10:00	18°C, 90% cloud cover, moderate breeze (Beaufort 4), no precipitation
26 September	09:30-10:30	17-18°C, 60% cloud cover, gentle breeze (Beaufort 3), no precipitation

Evaluation criteria

2.4.4 Criteria for establishing a population size class assessment based on a refuge density of 10/ha are given in Froglife (1999), as shown in Due to the high hedgerows and tall trees that surrounded the survey area perimeter, many of the mats were shaded during the survey visits. Start times were adjusted, where air temperature allowed, in order to reduce the impact of shading.

2.4.5 Table 2.6, but it should be noted that this is intended to be used in conjunction with a higher number of survey visits than normally undertaken for a presence / absence survey. Site scores can be compared to the Key Reptile Site selection criteria (Froglife, 1999) to establish the overall importance of a site for reptiles.

Limitations

2.4.6 During the survey visit on 1, 4 and 6 September 2023 the air temperature increased beyond the upper limited specified (18°C) in 2.4.1. However, the survey remained within the peak air temperature specified by Froglife (2015), which considers the optimal range to be 9-20°C. As the remaining survey visits took place during suitable conditions, these potential limitations are not considered to be significant.

2.4.7 The survey visits were delayed until September due to continuous hot weather that occurred during June. Prior to starting the survey, the survey area was inspected to ensure it had remained suitably set up. Several of the artificial refugia were found to have become engulfed by vegetation growth. New survey mats were deployed on 29 August where they were absent, one day prior to the commencement of the main survey period.

2.4.8 Due to the high hedgerows and tall trees that surrounded the survey area perimeter, many of the mats were shaded during the survey visits. Start times were adjusted, where air temperature allowed, in order to reduce the impact of shading.

Table 2.6: Population size class assessment and Key Reptile Site criteria (Froglife, 1999)

Species	Low Population Score =1	Good Population Score =2	Exceptional Population Score =3
Adder *Vipera berus*	<5	5 – 10	>10
Grass snake *Natrix helvetica*	<5	5 – 10	>10
Common lizard *Zootoca vivipara*	<5	5 – 20	>20
Slow worm *Anguis fragilis*	<5	5 – 20	>20
To qualify as a Key Reptile Site, the survey site must meet at least one of the following criteria:			
1. Supports three or more reptile species 2. Supports two snake species 3. Supports an exceptional population of one species (see above) 4. Supports an assemblage of species with a combined score of at least 4 (see above) 5. Does not satisfy 1 – 4 but is of particular regional importance due to local rarity			

2.5 General Limitations

2.5.1 See Appendix IX for general Legal and Technical Limitations which apply to this document.

2.5.2 The details of this report are valid until the dates shown in Table 2.7. Beyond these periods, if works have not yet been undertaken, the development proposals change or red line boundary changes, it is recommended that a review of the ecological conditions is undertaken.

Table 2.7: Validity of assessment

Survey Type	Validity period (CIEEM, 2019)	Date of final survey	Expiry date
GCN	18 months	28/06/2023	29/12/2024
Foraging and commuting bats	18 months	12/09/2023	12/03/2025
Hazel dormouse	18 months	22/11/2023	22/05/2025
Reptiles	18 months	26/09/2023	26/03/2025

2.6 Personnel

2.6.1 The personnel deployed on the surveys are listed in Table 2.8.

Table 2.8: Survey personnel and qualifications

Feature / Task	Personnel
GCN	Richard Emerson, Zoe Benefer
Foraging and commuting bats	Nick Pincombe, Richard Emerson, Dan Maude, Joe Dale, Zoe Benefer

Feature / Task	Personnel
Hazel dormouse	Becci Bond, Richard Emerson, Joe Dale
Reptile surveys	Tim Lees, Becci Bond, Dan Maude, Richard Emerson
Personnel	**Qualifications**
Nick Pincombe BA(Hons) MSc Cenv MIEMA MCIEEM	Managing Director with eighteen years' experience leading survey and impact assessment teams for a wide range of ecology and environmental planning projects. Natural England Class Licences to survey for bats (WML-CL18) and GCN (WML-CL08).
Tim Lees BA(Hons) MSc MCIEEM	Associate Director of Ecology with eleven years' professional consultancy experience. Licences to survey for bats (WML-CL17) and great crested newt (WML-CL08).
Becci Bond BSc (Hons) MCIEEM	Principal Ecologist with twelve years' professional consultancy experience. Licences to survey for bats (WML-CL17), great crested newt (WML-CL09) and hazel dormouse (WML-CL10a).
Dan Maude BSc (Hons) MRes qCIEEM	Consultant Ecologist with three years' survey experience.
Rich Emerson BSc qCIEEM	Assistant with two seasons' survey experience.
Joe Dale BSc MSc	Assistant with two seasons' survey experience.
Zoe Benefer BSc (Hons) MSc	Assistant with two seasons' survey experience.

3 Results

3.1 Great Crested Newt

eDNA survey

3.1.1 The GCN eDNA analysis results letters are presented at Appendix II and summarised in Table 3.1.

Table 3.1: Summary of eDNA analysis results

Pond	Result
P1	No access
P2	Negative for GCN DNA
P3	Dry at the time of survey
P4	Negative for GCN DNA
P5	Negative for GCN DNA
P6	No pond present
P7	Negative for GCN DNA
P21	Positive for GCN DNA
P22	Positive for GCN DNA

3.2 Foraging and Commuting Bats

3.2.1 There are 11 SSSI and one SAC within 10km of the survey area. Bat populations are not listed amongst the notified features for any of these sites.

Transect surveys

3.2.2 Monthly bat activity surveys were carried out between May and September 2023; see Appendix III for a plan showing survey transect and TPs. These mostly consisted of dusk surveys, but in September a dusk and dawn survey was carried out in the same 24hr period. Full survey results are included at Appendix IV and summarised in the tables and graphs below.

Transect data

3.2.3 Table 3.2 present a summary of all transect survey data collected during the 2023 bat active season.

Table 3.2: Monthly bat transect survey data

Date	Time	MYSP	PIPI	PIPY	PLAU	*Total*
May	Dusk	1	22	1	1	24
June	Dusk	0	27	0	1	27
July	Dusk	3	67	0	0	70
August	Dusk	0	59	4	1	63
September	Dusk	0	88	3	0	91
September	Dawn	0	67	19	4	86
Total		***4***	***330***	***27***	***7***	***361***
%		***1***	***91***	***7***	***2***	***100***

3.2.4 The overall abundance of foraging and commuting bats was moderate, with peak of 91 bat passes recorded during the September dusk transects. The lowest number of bat passes (24) was recorded during the May transect. Weather conditions across the surveys were generally good and were unlikely to discourage bat activity. The exception is potentially the May transect where air temperatures were between 13 and 11°C, although these were still within the recommended range for bat activity surveys. Rain showers may have impacted activity levels during the August transect but the effects do not appear to be significant given the total number of bat passes was similar to other months. The variation in total bat passes may be due to seasonal variations in bat activity. Lower activity levels observed during May and June, which then increased and remained fairly consistent between July and September.

3.2.5 In total 361 bat passes were made across the six transect surveys, with at least four different species of bat recorded. Common pipistrelle bats were significantly more common than any other species, with 330 passes in total (91%). Soprano pipistrelle *Pipistrellus pygmaeus* made up a considerable proportion of other bat passes (27 passes; 7%), followed by brown long-eared *Plecotus auritus* (7 passes; 2%), and Myotis bats *Myotis spp.* (4 passes; 1%).

3.2.6 Bat activity was identified at all transect points, however the level of activity varied across the survey area. Particularly high activity was consistently recorded at central northern boundary, between TP7 and TP9, and at the south-eastern corner at TP12. Bat activity was also fairly high at TP10 at the north-eastern corner, as well as TP4 at the western boundary. These areas constitute the higher quality foraging and commuting habitats for bats within the survey area and generally consist of mature hedgerow, mature scrub or woodland edge.

3.2.7 The lowest level of activity was recorded at TP5, which had one bat pass across the six surveys. TP5 was located at the centre of the western field and had an absence of cover features or good quality foraging habitat. The remaining transect points had a relatively consistent level of bat activity, with foraging and / or commuting recorded on two or more of the transects.

Remote monitoring

3.2.8 Deployment of remote automated bat detectors coincided broadly with each transect survey; see Appendix III for a plan showing the locations of remote detector deployments. Table 3.3 presents a summary of all bat passes recorded during remote monitoring.

Table 3.3: Total number of bat passes during remote monitoring, all species

Month (2023)	Detector	EPSE	MYSP	NYLE	NYNO	PINA	PIPI	PIPY	PLAU	Total
May	SM1	0	0	0	2	0	1488	16	0	1506
	SM2	0	0	0	2	0	338	122	0	462
June	SM3	1	0	0	6	6	1125	2	12	1152
	SM4	2	0	1	3	3	234	6	3	252
July	SM5	1	701	0	1	0	1213	65	9	1990
	SM6	0	1	0	0	0	109	6	0	116
August	SM7	2	2	0	6	1	1420	75	24	1530
	SM8	2	5	0	5	0	2350	74	50	2486
September	SM9	0	2	0	3	1	45	2	29	82
	SM10	0	7	0	1	3	1468	34	46	1559
Total		***8***	***718***	***1***	***29***	***14***	***9790***	***402***	***173***	***11135***
%		***0.07***	***6.45***	***0.01***	***0.26***	***0.13***	***87.92***	***3.61***	***1.55***	***100***

3.2.9 The data show that total bat passes per detector and mean bat passes per hour (BPPH) were variable across the survey area. Detector SM8 recorded very high levels of bat activity with 2486 passes over the five-night monitoring period. SM8 was located at the central southern boundary of the survey area adjacent to Burleigh Lane. High levels of bat activity were recorded at SM1, SM5, SM7 and SM10, all of which recorded over 1500 bat bats across the five nights. SM1 was also located on the southern boundary adjacent to Burleigh Lane. SM5 was located at the centre of the western boundary at the edge of a small offsite woodland. SM7 was located toward the western end of the southern boundary, and SM10 was located at the centre of the eastern boundary.

3.2.10 The lowest level of activity was recorded at SM9, which was located within a lone, young oak tree toward the centre of the western field. This was a similar location to TP5 which recorded the lowest level of bat activity during the transect surveys. Low levels of activity were also recorded at SM2 (462) and SM6 (116). SM2 was located within a mature apple *Malus spp.* toward the centre of the survey area and close to the derelict buildings. SM6 was located at the western end of the northern boundary, which was bordered by a recent housing development.

3.2.11 High to moderate levels of bat activity generally correlated with higher quality habitat for foraging and commuting bats, particularly along the eastern, southern and western boundaries. These results were similar to the transect surveys, however high levels of activity were also recorded at the centre of the northern boundary during the transect surveys at TP7 and TP9. No static detector was deployed in the same location as TP7 or TP9, which may reflect the lower levels of bat activity recorded on the northern boundary during the remote monitoring survey.

3.2.12 The overwhelming majority of bat passes across the survey area during the remote monitoring survey were from common pipistrelle bats (9,790 passes or 87.92%). *Myotis* bats made up a significant proportion of the remaining bat passes (718 pass or 6.45%). However, the bulk of these *Myotis* recordings came from one detector, SM5, which was located at the western boundary

adjacent to a small patch of offsite woodland. This offsite woodland may provide valuable habitat for *Myotis* bats.

3.2.13 Figure 3.1 shows an index of relative bat activity recorded in the survey area, expressed as BPPH. The data are shown per detector deployment and by month. This again indicates that bat activity within the survey area varied from low to high across the survey period, with particularly high levels of activity recorded at SM5 and SM8.

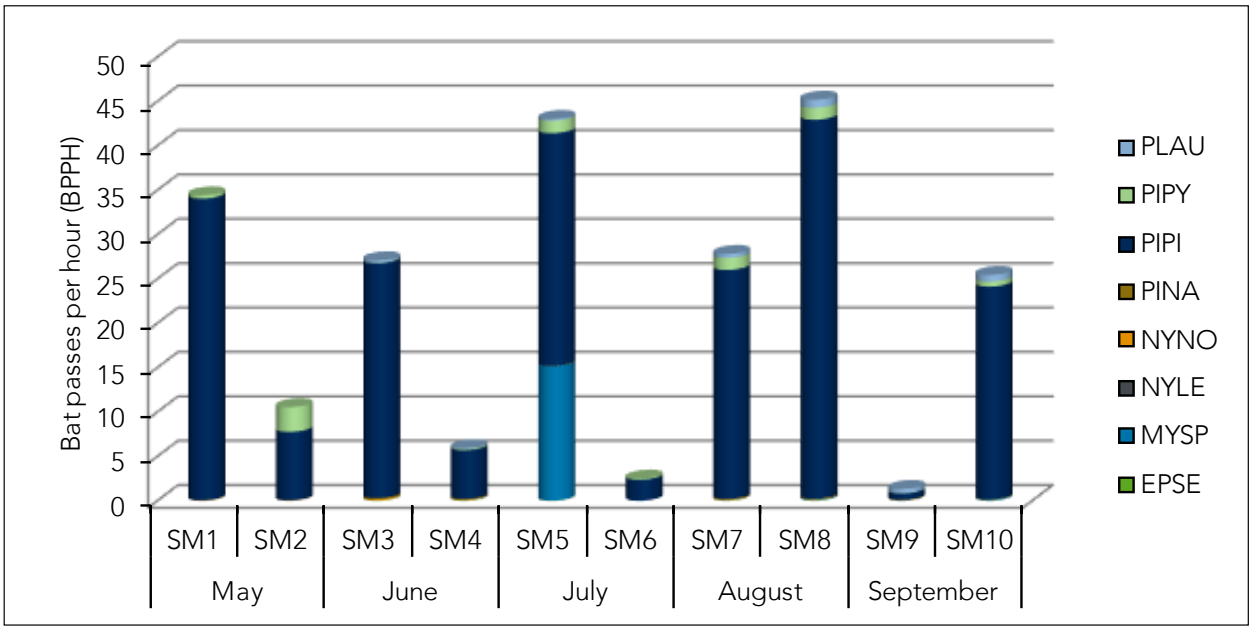

Figure 3.1: Bat passes per hour, by detector and month

3.3 Hazel Dormouse

Nest tube survey

3.3.1 The nest tube survey recorded no evidence of hazel dormouse during the survey period. Evidence of other species of mouse, including wood mouse *Apodemus sylvaticus*, were recorded toward the western edge of the survey area, along with one recording at the south-eastern corner. A summary of the survey results is displayed in Table 3.4 with locations of hazel dormouse and other species shown at Appendix VI.

Table 3.4: Summary of hazel dormouse survey results

Survey	1	2	3	4	5	6
Date 2023	28 June	26 July	18 August	20 September	10 October	22 November
Hazel dormouse	0	0	0	0	0	0
Other species	0	0	1 part-built nest and droppings	1 nut stash and droppings	4 nut stashes – one with droppings	7 full nest – 4 with live wood mouse present; 5 part-built nests; 2 nut stashes

Suspected wood mouse nest found at the south-western corner of the survey area on 22 November 2023

Suspected wood mouse nest found at the western boundary of the survey area on 22 November 2023.

3.4 Reptiles

Visual encounter / artificial refuge survey

3.4.1 The VES and ARS (including natural / pre-existing refuges) recorded a total of one grass snake across the survey period. The sole record was located toward the central northern boundary close the norther end of the derelict buildings.

3.4.2 No other reptile species or signs of their presence (e.g., skin sloughs, eggs / egg-cases) were observed during the survey. A summary of the survey results is displayed in Table 3.5. Peak count is highlighted in bold.

Table 3.5: Summary of reptile survey results

Survey	1	2	3	4	5	6	7
Grass snake	0	0	**1U**	0	0	0	0

U = adult unsexed

4 Evaluation

4.1 Introduction

4.1.1 This section evaluates the survey area in terms of the protected species present or potentially present on site or its immediate vicinity, in the context of relevant legislation and planning policy. See Appendix VIII for a review of the legislation and planning context.

4.2 Great Crested Newt

Presence or absence of GCN

4.2.1 All ponds within 250m of the survey area boundary that were potentially suitable for GCN, also including pond P7 which was just beyond 250m, were subject to eDNA testing. Ponds P21 and P22 returned a positive result for GCN eDNA. Ponds P2, P4, P5 and P7 were negative for GCN eDNA. No access was granted to P1, P3 was dry at the time of survey and no pond was present at the location of P6. No GCN were recorded under reptile refugia during the reptile survey.

4.2.2 The surveys were carried out during the peak sampling season and are considered to provide a good level of confidence in the presence or likely absence of GCN within surveyed ponds in 2023.

Site Evaluation

4.2.3 Overall, habitats within the survey area provide a range of features which could support a population of GCN during the terrestrial phase of their lifecycle. The composition of unmanaged grassland with a variable sward height and structure is suitable for foraging GCN. The dense and scattered scrub provide shelter and dispersal habitat, while the adjacent hedgerows and woodlands offer hibernation potential. The survey area is linked to further areas of suitable terrestrial habitat which continue off site, particularly to the south and east where there is extensive open countryside. This connectivity will persist following completion of the development.

4.2.4 There were an additional 13 ponds (P8-P20) located between 250m and 500m from the survey area. The majority of GCN will remain within a core area of up to c.50–250m from the breeding pond (250m being the estimated maximum routine migratory range; Cresswell & Whitworth, 2004) if that area can fulfil their lifecycle requirements although, as with all amphibians, small numbers of individuals (often juveniles) will disperse as colonisers to distances of 1km or more (Langton *et al.*, 2001). Research on the efficiency of GCN capture techniques within a range of habitats at various distances from a breeding pond concluded that (Cresswell & Whitworth, 2004):

> *"The most comprehensive mitigation, in relation to avoiding disturbance, killing or injury is appropriate within approximately 50m of a breeding pond. It will also almost always be*

necessary actively to capture newts 50-100m away. However, at distances greater than 100m, there should be careful consideration as to whether attempts to capture newts are necessary or the most effective option to avoid incidental mortality… At distances greater than 200-250m, capture operations with hardly ever be appropriate."

4.2.5 For this reason, ponds located greater 250m (excluding P7) from the survey area were not subject to an eDNA survey because if any GCN were present within these ponds they were unlikely to disperse the distance required to reach the survey area. This likelihood is reduced further where a significant barrier to dispersal is present.

4.2.6 Ponds P21 and P22, which tested positive for GCN eDNA, were located c.125m south of the survey area boundary. There were no significant barriers to dispersal between P20 and P21 and the survey area. As such, it is considered possible that GCN may be present within the survey area during the terrestrial phase of their lifecycle. The species are also relatively likely to disperse through the survey area at certain times of year when moving between ponds in the locality and to / from aquatic and terrestrial habitats. It is concluded that the risk of GCN being present within the site is moderate to high.

4.2.7 In the absence of survey data for populations of GCN in ponds within 250m of the survey, it is difficult to assign precise importance. Accordingly, the survey area is considered to be of Local-District Importance for GCN.

Impact assessment

4.2.8 It is concluded that the risk of GCN being present within the survey area is moderate to high. Without mitigation, the Proposed Development is likely to lead to the following impacts on GCN and their habitats as a result of vegetation removal, site clearance, creation of access tracks and materials storage compounds, vehicle movements, groundworks and construction of buildings and hardstanding:

- Any GCN present during the proposed works would be at risk of killing, injury and disturbance, which would constitute an offence under the Wildlife & Countryside Act 1981 (as amended) (WCA) and the Conservation of Habitats and Species Regulations 2017 (as amended) (CHS);
- No negative impact is predicted for aquatic habitats, as no ponds are present within the survey area;
- Moderate significance negative impacts are predicted due to the partial destruction and temporary disturbance to up to c.2.64ha of potentially suitable habitat (depending on the final extent of development proposals) of suitable terrestrial habitats within the survey area; and
- No long-term impacts are predicted in relation to isolation because dispersal habitats within the site (boundary hedgerows and woodland) will be retained, and because suitable terrestrial habitats will continue to exist close to each potentially suitable GCN pond post development.

4.2.9 A mitigation licence will need to be obtained from Natural England to enable the development to proceed. Available mitigation and licensing options include:

- Either undertake a translocation of GCN from the construction zone to a suitable receptor site prior to site preparation and commencement of works, to avoid the risk of killing / injury to GCN. This would require a conventional European Protected Species Mitigation (EPSM) Licence to be obtained from Natural England; or
- Register the site under the District Level Licensing (DLL) scheme for West Sussex[6].

4.2.10 If a conventional EPSM Licence is preferred then further surveys for GCN will be necessary to establish population estimates within ponds within 250m of the survey area, together with presence/absence (eDNA) data for ponds 250-500m from the site, as recommended at section 5.2, to inform a suitable mitigation strategy for the proposed development.

4.3 Foraging and Commuting Bats

Species assemblage

4.3.1 Species diversity recorded during the bat activity surveys included at least eight species. Their national conservation status is listed in Table 4.1 (BCT, 2010; Mathews *et al*., 2018; Sussex Bat Group[7]). Common pipistrelle, soprano pipistrelle, noctule *Nyctalus noctula*, serotine *Eptesicus serotinus*, and brown long-eared have previously been recorded within 2km of the site, as have *Myotis* species, as confirmed during the desk study stage of the PEA (Ethos, 2021).

4.3.2 *Plecotus* spp. and *Myotis* spp. call parameters overlap significantly within genus, and it is not normally possible to conclusively identify them to species level unless they are in the hand. Brown long-eared bats are widespread and relatively abundant both in Sussex and nationally. Grey long-eared bats are rare, and their restricted national distribution is focused on southern coastal areas. As such, the low numbers of long-eared bats recorded during the surveys are assumed to be brown long-eared bats. The *Myotis* spp. calls recorded within the survey area were most closely matched to the call parameters of Brandt's *M. brandtii*, Daubenton's *M. daubentonii*, whiskered *M. mystacinus* bats and Natterer's *M. nattereri* bats. The survey area falls broadly within the known distribution of all four species. As *Myotis* spp. cannot be confidently identified they are not listed in Table 4.1.

Table 4.1: Conservation status of recorded bat species (abundance and distribution)

Species	Sussex abundance/distribution	UK abundance/distribution	UK status
Serotine	Uncommon, widespread	Uncommon, widespread, southern England	Vulnerable
Leisler's bat *Nyctalus leisleri*	Rarely recorded	Scarce but widespread to southern Scotland	Near threatened

[6] https://naturespaceuk.com/district-licensing/about/

[7] Sussex Bat Group website: Bats in Sussex. Accessed online [19/12/23] at: https://www.sussexbatgroup.org.uk/batsinsussex

Species	Sussex abundance/distribution	UK abundance/distribution	UK status
Noctule	Uncommon, widespread	Uncommon, widespread, absent in Scotland	Least concern
Nathusius' pipistrelle *Pipistrellus nathusii*	Scarce, widespread	Scarce, widespread, includes migrants	Least concern
Common pipistrelle	Abundant, widespread	Widespread, abundant	Least concern
Soprano pipistrelle	Fairly common, widespread	Fairly common, widespread	Least concern
Brown long-eared	Relatively abundant, widespread	Widespread, relatively abundant	Least concern

Species abundance

4.3.3 Figure 4.1 summarises species composition recorded during passive monitoring within the survey area over the course of the survey period to date. The data are expressed as BPPH and give an index of relative bat activity within the site. It is important to note that BPPH is not the same as total number of bats, as a single bat might pass the detector on multiple occasions when foraging up and down a feature. This shows that the majority (204.01 BPPH or 91.34%) of all bat calls recorded were from *Pipistrellus spp*. bats, with the sum of BPPH registered at each location being 195.54 BPPH or 87.55% for common pipistrelle, 8.17 BPPH or 3.66% for soprano pipistrelle, and 0.30 BPPH or 0.13% for Nathusius' pipistrelle. Of the remaining bat passes, *Myotis spp*. (15.45 BPPH or 6.92%) were the next most frequently recorded, followed by brown long-eared (3.12 BPPH or 1.40%), noctule (0.59 BPPH or 0.26%), serotine (0.16 BPPH or 0.07%) and finally Leisler's bat (0.02 BPPH or 0.01%). These results are broadly consistent with those recorded during the transect surveys.

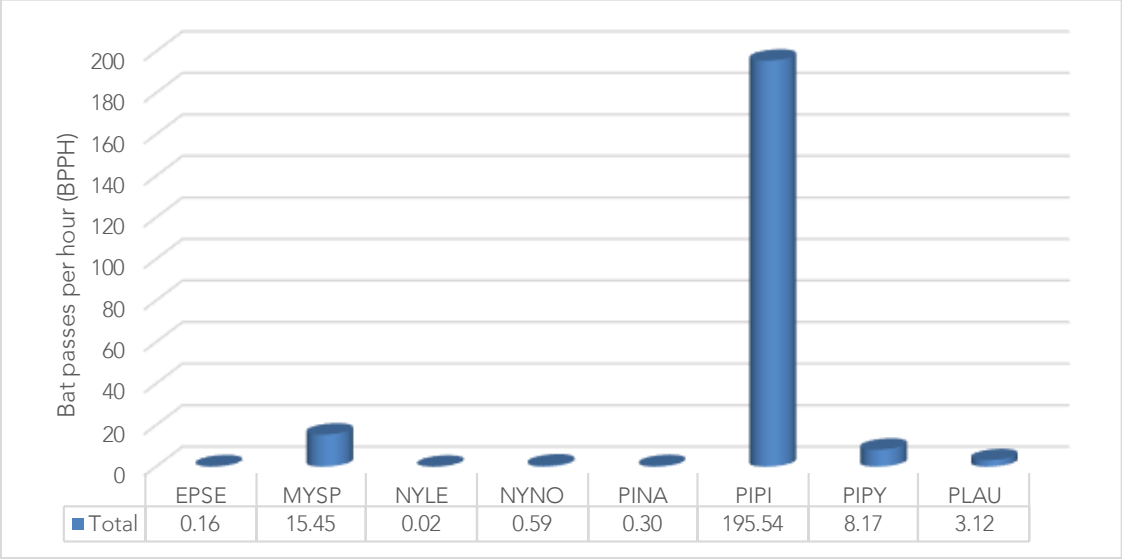

Figure 4.1: Bat pass species composition, all remote monitoring data

Site evaluation

4.3.4 Due to the high proportion of common and widespread bat species and variable levels of activity recorded, the survey area is considered to be of Local Importance for its bat population.

Table 4.2:: Importance of bat assemblage (Southern England)

Species	Importance of roosts	Importance of commuting and foraging habitat	Importance of assemblage
Widespread Common pipistrelle Soprano pipistrelle Brown long-eared	No roosts have been identified within the survey area for species in this category. Two maternity roosts and one unspecified roosts are to be present within 2km and have previously been granted EPSM licences. It is anticipated that smaller roosts may exist within the survey area. Negligible (Site) importance	The habitats within the survey area are assessed as providing moderate suitability, comprising grassland, scrub and hedgerow and woodland. ▸ Adjacent woodland, grassland and ponds provide further opportunities and connectivity into the wider area. ▸ Low-high relative levels of bat activity in many areas. Higher levels recorded along the site boundaries where mature hedgerow or woodland were present. ▸ Bat activity dominated by common (91.34%). ▸ *Myotis* sp. calls resembled Brandt's bats, Daubenton's bats, whiskered and Natterer's bat. All four species are assumed as present. ▸ Only one Leisler's bat call was recorded during the	3 (of a maximum 3)
Widespread but not as abundant in all geographies Noctule *Myotis* spp.	No roosts have been identified within the survey area for species in this category. No *Myotis* species roost within 2km. It is anticipated that smaller roosts may exist within the survey area. Negligible (Site) importance		10 (of a maximum 10)
Rare or restricted distribution Serotine Leisler's bat (discounted) Nathusius pipistrelle	No roosts have been identified within the survey area for species in this category. Negligible (Site) importance		6 (of a maximum 12)

Species	Importance of roosts	Importance of commuting and foraging habitat	Importance of assemblage
Rarest Annex II species and very rare No species	No records of roosts Negligible (Site) importance	remote monitoring surveys which accounted for 0.01% of the bat activity data. No Leisler's bat calls were recorded during the transect survey. To reflect the single call recorded, Leisler's bat has been discounted from this assessment.	0 (of a maximum 20)
Overall score 19 / 45 = 42%; does not meets threshold for County Importance. The survey area is therefore considered to be of Local Importance for its bat population.			

Impact assessment

Habitat losses and land use changes

4.3.5 The Proposed Development will result in a permanent loss of up to c.2.64ha of neutral grassland, bramble scrub, mixed scrub and woodland across the survey area. Boundary habitats within the survey area are expected to be retained excluding a new vehicle access route at the north-western corner to join with Sycamore Lane. Creation of the new access is expected to result in the loss of c.6-10m of an existing line of trees.

4.3.6 The highest levels of bat activity were recorded at the eastern, southern and western boundaries which will be retained and protected. Higher levels of bat activity were recorded along the northern boundary but were generally lower toward the north-western corner where the new access route will be constructed. Providing other boundary habitat remain intact, no significant negative impact to foraging and commuting bats is foreseen from the small loss of habitat in the north-western corner.

4.3.7 Bat activity within the survey area was dominated by common pipistrelle bats, which are habituated to semi-urban environments and are therefore unlikely to be displaced following construction of the Proposed Development. Other species which prefer to forage along woodland edge and open habitats, or are more tolerant to semi-urban conditions, including soprano pipistrelle, noctule (Species of Principal Importance) and serotine are unlikely to be significantly affected by the Proposed Development beyond the construction stage.

Increases in artificial light

4.3.8 Although proposed habitat losses and changes in land use within the survey area are not predicted to result in significant impacts to foraging and commuting bats, the Proposed Development is likely to result in a risk of increased artificial light levels. Impacts differ between species, and complex interactions exist between potential beneficial effects (such as exploiting concentrations of invertebrate prey abundance) and adverse effects such increased exposure to

predation, increased risk of mortality through collision with vehicles (when feeding around street lights), reduced invertebrate abundance in unlit areas reducing the availability of prey to light-intolerant bats, and fragmentation of habitats as a result of intolerant species avoiding light sources.

4.3.9 Details of the lighting proposals are not yet available; however, Stone (2013) presents a summary of the anticipated impact of artificial light on each UK species by behaviour. The impact of light on foraging and commuting bats is classified as low for serotine and individuals of the genera *Nyctalus* and *Pipistrellus* – which comprised 91.69% of all bats recorded during passive monitoring at the survey area. These species are unlikely to be significantly affected by the Proposed Development. Light intolerant species recorded at the site, including brown long-eared and individuals of the genera *Myotis*, together comprised 8.31% of activity recorded during passive monitoring. Use of the site by these species may be reduced by the proposals, but it is likely that the development can be accommodated without adverse effects on the conservation status of local bat populations within their natural range. These species are often associated with woodland habitats, and indeed the majority of calls recorded came from SM5 which was deployed adjacent to a small patch of offsite woodland. The offsite woodland will be protected as part of the Proposed Development.

4.3.10 Recommendations including a sensitive lighting scheme and habitat creation to avoid and mitigate predicted impacts are set out in Chapter 5.

4.4 Hazel Dormouse

Presence or absence of hazel dormouse

4.4.1 There were no observations of hazel dormouse, or signs of their presence such as nests, gnawed nuts or droppings, during the course of the 2023 survey period. The survey findings provide a good level of confidence that hazel dormouse is likely to be absent from the site.

4.4.2 Surveys concluded in November 2023 and achieved a detection probability index score of 20 resulting in a good degree of confidence in the survey findings.

4.4.3 In conclusion the survey area is considered to be of Negligible Importance for hazel dormouse and no impacts to hazel dormouse are anticipated as a result of the Proposed Development.

4.5 Reptiles

Presence or absence of reptiles

4.5.1 The survey findings indicate that a low population of grass snake was present within the survey area during the 2023 survey season. Surveys were carried out in suitable weather conditions at an appropriate time of year for reptile surveys and the density of refuges exceeded the recommended level (70 refuges were used across approximately 2.64ha of suitable habitat). The survey results are therefore considered to provide an accurate account of the reptile assemblage

on site. However, the aim of this survey was to establish presence or likely absence and a greater level of survey effort would be required in order to obtain a reliable population estimate. Given the good quality habitat for reptiles within the survey it is likely that a larger population of reptiles could be present.

Site evaluation

4.5.2 The survey area contains good quality habitats for reptiles, dominated by a mosaic of neutral grassland, scrub, woodland and is surrounded by hedgerow and lines of trees which provide shelter, foraging and dispersal opportunities. Rubbish, rubble associated with the derelict buildings may provide additional shelter and hibernation habitat.

4.5.3 Site location (in relation to the species' range), vegetation structure, insolation, aspect, topography and surface geology, prey abundance, refuge opportunity and hibernation potential are all favourable for reptiles. In addition, the site benefits from good connectivity to further extensive areas of good quality reptile habitat in the local landscape, including grassland, woodland, scrub and mature hedgerow to the east and south. Additional suitable habitat is present to the north-east, but this is somewhat isolated from the survey area by residential properties. Taken together, the habitats within the survey area provide the necessary lifecycle requirements of common reptile species such as grass snake, slow worm and common lizard.

4.5.4 The single adult grass snake was recorded toward the centre of the northern boundary at the northern end of the derelict buildings. The peak count of one adult grass snake indicates that the survey area supports a low population of this species.

4.5.5 No other species of reptile or signs of their presence were recorded during the survey. It is likely that adder is absent from the site, but it would not be unexpected to occasionally encounter common lizard or slow worm. Indeed, slow worm has been recorded locally as confirmed during the desk study (Ethos, 2021).

4.5.6 Overall, the survey area achieves a site score of 1 and does not meet the criteria for a Key Reptile Site (Froglife, 1999; see Table 2.6). The Proposed Development is not anticipated to impact the local status of grass snake and therefore the survey area is considered to be of Negligible Importance for its reptile population.

Impact assessment

4.5.7 The recorded reptile (shown at Appendix VII) was located toward the centre of the northern boundary of the survey. Given the suitability of other habitats in the remainder of the survey area for hibernation, shelter and potentially egg-laying, it is concluded that grass snakes are likely to be present throughout the survey area at low densities, though their distribution within the survey area may shift over the course of the year.

4.5.8 Without mitigation, it is considered that the Proposed Development is likely to result in the following impacts to reptiles:

- Temporary risk of killing and injury to individual reptiles resulting from ground clearance, creation of access tracks and materials storage compounds, vehicle movements and groundworks, which would be an offence under the WCA; and
- A significant area of suitable habitat (up to c.2.64ha) supporting a low population of grass snake will be removed, including neutral grassland, scrub and woodland. This impact will be offset to a degree by replacement with garden habitats which, in the medium to long-term, may regain some suitability for reptiles.

4.5.9 Recommendations to avoid and mitigate predicted impacts are set out in Chapter 5.

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5 Recommendations and Conclusion

5.1 Introduction

5.1.1 Recommendations are made below for avoidance and mitigation of impacts to protected species, to prevent an offence under the relevant legislation from occurring, and to reduce the risk of development proposals resulting in significant effects on the population and distribution of species recorded during the surveys. The recommendations should be read alongside those contained in the PEA (Ethos, 2021) which continue to apply, including those for ecological enhancement.

5.2 Avoidance and Mitigation Measures

5.2.1 The following species / groups (Table 5.1) require specific measures to be adhered to prior to and during construction to ensure that an offence under the relevant legislation is avoided.

Table 5.1: Recommended mitigation, avoidance and enhancement measures

#	Recommended mitigation, avoidance and enhancement measures
R1	If a conventional Mitigation Licence is preferred for GCN, population estimate surveys will be required for ponds within 250m of the survey area from mid-March to mid-June, together with presence/absence (eDNA) data for ponds 250-500m from the site. Alternatively, the Proposed Development can join the District Level Licensing scheme for West Sussex.
R2	Negative impacts on foraging and commuting bats and other nocturnal species will be avoided, during both construction and operation of the Proposed Development, by preparing a lighting strategy to avoid light spill falling onto retained habitats.
R3	A translocation of reptiles from the construction zone to a suitable receptor site will be undertaken prior to site preparation and commencement of works, to avoid the risk of killing / injury to reptiles.

R1: Great crested newt

5.2.2 A GCN survey is recommended to establish a population estimates in ponds within 250m of the survey area, together with presence/absence (eDNA) data for ponds 250-500m from the site. Surveys using conventional techniques should be carried out by a licenced herpetologist following recommended guidelines (English Nature, 2001). Each pond should be surveyed on six occasions during the breeding season (between mid-March and mid-June), with at least three visits between mid-April and mid-May. Methods include torch survey, bottle trapping and egg searches.

5.2.3 The alternative is to join the District Level Licensing scheme for West Sussex, led by the Nature Space Partnership[8]. The licensing route removes the requirement for further survey and involves financial contributions based upon proposed development impacts. This method can be undertaken year-round and provides detailed costs and any mitigation requirements, which can be submitted in support of a planning application.

R2: Bats

5.2.4 Negative impacts on foraging and commuting bats and other nocturnal species will be prevented, during both construction and operation of the Proposed Development, by avoiding light spill falling onto retained habitat features, particularly the hedgerows, woodland and lines of trees at the survey area boundaries. The lighting design strategy should refer to guidance from the Institute of Lighting Professionals (ILP) on bats and artificial lighting, and take account of the following recommended specifications (ILP / BCT, 2023):

- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component.
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.
- The use of specialist bollard or low-level downward directional luminaires to retain darkness above should be considered. However, this often comes at a cost of unacceptable glare, poor illumination efficiency, a high upward light component and poor facial recognition, and their use should only be as directed by the lighting professional.
- Column heights should be carefully considered to minimise light spill.
- Only luminaires with an upward light ratio of 0% and with good optical control should be used (refer to ILP guidance for the reduction of obtrusive light).
- Luminaires should always be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting should be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

R3: Reptiles

5.2.5 The population of grass snake in the survey area is at risk of killing or injury during construction. A translocation of reptiles from the construction zone to a suitable receptor site will be carried

[8] https://naturespaceuk.com/

out prior to site preparation and commencement of works, to avoid the risk of killing / injury. The translocation will be implemented in accordance with a Method Statement which has been agreed with the Local Planning Authority and is likely to include the following:

- ***Appointment of Ecological Clerk of Works***: An Ecological Clerk of Works (ECoW) will be appointed to oversee operations which could negatively affect reptiles and other ecological features of value.
- ***Selection and enhancement of a receptor site***: This receptor site may be located on site if space allows, alternatively an off-site receptor will need to be identified. Dependant on the suitability of the agreed receptor site, habitat management may be required prior to the commencement of the translocation to enhance the receptor site's capacity to support a population of reptiles. This may include creation of hibernacula and scrub management.
- ***Erection of reptile exclusion fencing:*** The translocation area will be fenced-off from surrounding habitats using reptile exclusion fencing. This will be left *in-situ* following the completion of the translocation, to ensure that reptiles do not re-colonise the site during construction.
- ***Capture and translocation***: Capture of reptiles will be undertaken by hand, facilitated by the laying of artificial refuges to help concentrate capture effort. A capture period of at least 30 and up to 60 days is likely to be required.
- ***Habitat manipulation***: Once the translocation is underway, if captures begin being to diminish it is often helpful to undertake habitat manipulation to reduce the amount of suitable vegetation cover and render any remaining reptiles easier to catch. This will include strimming the grassland and brush-cutting bramble and scrub into progressively smaller patches within the construction zone.
- ***Destructive search:*** Following completion of the translocation, sites of potential refuge/hibernation (e.g. log / rubble piles or compost heaps) will be deconstructed using hand tools. Remaining areas of vegetation will be progressively reduced in height. Finally, the top soil will be carefully and systematically excavated and removed from site. Clearance will be carried out slowly and methodically under the direction of the ECoW.
- ***Toolbox talks***: All site operatives will receive a briefing from the ECoW to explain the legal protection for reptiles, the methods to be followed, tips on identifying reptiles, and the procedure to be followed should a reptile be found at any stage during the works.
- ***Timing of the works***: The translocation, destructive search and site clearance works will be programmed to take place during the active season for reptiles, broadly late March to October.
- ***Nesting birds***: As a result of the precautionary timing outlined above, it is possible that the work will be carried out during the nesting bird season which runs from early March to late September. If vegetation clearance is required during the nesting season, a survey for active bird nests will be carried out by the ECoW immediately prior to the works. If an active nest is found, the nest must be cordoned off and works adjacent to this nest must be delayed until such time that the chicks have fledged.

- ***Procedure if reptiles are encountered***: If reptiles are found within the construction zone during the works, site operatives will be advised to cease activity in its vicinity while advice from the ECoW is sought. The ECoW will then assess the most appropriate course of action which may include removing the individual(s) from the site and moving it to an area of suitable habitat outside of the construction zone.

5.3 Other Ecological Protection Measures

5.3.1 The following ecological protection measures (Table 5.2) will be carried out as part of the Proposed Development scheme.

Table 5.2: Recommended precautionary measures

#	Recommended precautionary measures
R4	Removal of nesting bird habitats (including vegetation and buildings) will be undertaken outside of the bird nesting season, which runs from 1 March to 31 August. It will therefore be carried out between September and February, but should be planned and implemented in accordance with the recommendations above, as other protected species may still be present outside of the bird breeding season. Any construction works undertaken within the bird breeding season where suitable bird breeding habitat exists will require a site check for nesting birds by a suitably qualified ecologist. This will take place no more than two days prior to works commencing. This is to ensure that no disturbance to active bird nests occurs. If a nest is found it must be cordoned off and works adjacent to the nest must be delayed until such time that the chicks have fledged from the nest. This will be supervised by a suitably qualified ecologist
R5	Hoardings / tree protection fencing will be installed at the construction zone perimeter for the duration of the works to protect the boundary hedgerows and offsite woodland from temporary impacts including noise, light and dust pollution. The exact location of hoarding will be led by the root protection zones of surrounding trees, to be confirmed by the arboricultural report for the survey area.
R6	British Standard BS 5837:2012 will be followed at all times during construction when working in close proximity to trees or shrubs which are to be retained. According to BS 5837:2012 the root protection area is 12x diameter of the trunk (diameter is measured around the trunk at a height of 1.5m above ground level), which will constitute the construction exclusion zone (CEZ). The distance is measured from the centre of the trunk to the nearest part of any excavation or other work. If a separate tree survey is carried out for the proposed development, works will be undertaken in accordance with the approved arboricultural method statement.
R7	To enable continued dispersal of hedgehogs (which require large territory sizes) and other small mammals across the site and within the local area following the Proposed Development, small access gaps to measure c.13x13cm are recommended to be provisioned at the base of all new fence boundaries. These will allow easy passage for small mammals to continue foraging in the area while still being small enough to contain pets.

5.4 Ecological Enhancement

5.4.1 The following ecological enhancements (Table 5.3) should be considered to improve the value of the survey area for biodiversity after construction.

Table 5.3: Preliminary recommendations for ecological enhancement

#	Preliminary recommendations for ecological enhancement
R8	Buffers of less intensively managed vegetation (e.g. coarse grasses and wildflowers, including the use of tussock-forming grass species such as cock's foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus*, tufted hair-grass *Deschampsia cespitosa* and false oat-grass *Arrhenatherum elatius*) will be created within soft landscaped areas within the Proposed Development, towards the survey area boundaries and alongside hedgerows and woodland. This will help to maintain / enhance ecological connectivity through the survey area for reptiles, amphibians and small mammals, and provide forage for invertebrates.
R9	Hedgerow creation and / or restoration as part of the landscaping plan for the survey area will use a range of native shrub species. Fruit, seed, nut and nectar-bearing species will be used preferentially when selecting species for landscape planting, so that food sources are available throughout the year (e.g. hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, field maple *Acer campestre*, dogwood *Cornus sanguinea*, privet *Ligustrum vulgare*, spindle *Euonymus europaeus* and honeysuckle *Lonicera periclymenum*). If an evergreen hedge is required for landscape screening, suitable native species include holly *Ilex aquifolium*, yew *Taxus baccata*, although both can be rather slow growing. Beech *Fagus sylvatica* and hornbeam *Carpinus betulus* are also widely used as hedging plants and, although not evergreen, these will keep their brown leaves through winter if trimmed in late summer.
R10	Habitat piles will be created at the edges of the survey area close to hedgerows and woodland. These will provide additional hibernation and shelter resources for amphibians, invertebrates, reptiles, and a range of other wildlife, and egg-laying substrate for grass snakes. Hibernacula can be created by partially burying logs and stones in sheltered areas away from flood risk, and covering over with earth or turf. Breeding habitats can be created by collecting grass clippings and other prunings arising from landscape management of the site, and composting them in a secluded corner of the site. Deadwood piles can be created using arisings from site clearance to provide shelter and breeding opportunities for invertebrates, particularly saproxylic species which are dependent on deadwood.
R11	The value of the survey area for birds will be enhanced by installing a range of artificial nest boxes. These will be placed on retained mature trees within the development or at the survey area boundaries or incorporated within building facades. For instance: ▪ New buildings: nest boxes can be installed under the eaves for birds that utilise buildings for nesting, e.g. house sparrow *Passer domesticus* and swift *Apus apus*. These species are of principal importance, of conservation concern and / or are notable in Sussex. ▪ Trees: nest boxes with entrance holes suitable for tit species, woodpeckers and nuthatches, and open-fronted boxes suitable for spotted flycatcher *Muscicapa striata* or song thrush *Turdus philomelos*, and treecreeper *Certhia familiaris* boxes.
R12	The value of the survey area for bats will be enhanced by installing a range of artificial roost boxes. These will be placed on retained mature trees within the development or at the site

#	Preliminary recommendations for ecological enhancement
	boundaries, or incorporated within building facades. Boxes suitable for a range of species should be used, for instance: ▪ New buildings: integral bat tubes can be installed within buildings which face vegetated areas. Bat tubes can be incorporated into the design of the building so that only the access holes are visible from the exterior of the building. The Schwegler 1FR or 2FR Bat Tube is designed to meet the characteristic requirements of the types of bats that inhabit buildings such as pipistrelles or serotines. It is designed to be installed on the external walls of buildings, either flush or beneath a rendered surface. ▪ Pipistrelles: bat boxes suitable to install on mature trees either within or at the edges of the development include the Schwegler 1FF Flat Bat Box, or other manufacturer's equivalent. ▪ Noctules *Nyctalus spp.* and brown long eared bats: bat boxes suitable to install on mature trees either within or at the edges of the development include the Schwegler 2F General Purpose Bat Box or the 2FN Woodland Bat Box, or other manufacturer's equivalent. Bat boxes on buildings should ideally be located south-facing (between south-east and south-west) and above 4m from ground level. On trees, bat boxes should ideally be located on three aspects of each tree (facing north, south-east and south-west) and at ≥5m from ground level. In both cases they should be installed facing vegetation features such as mature hedgerows or trees, but with a clear line of flight for bats exiting the roost, and away from sources of artificial light.

5.5 Conclusions

5.5.1 In the absence of mitigation, the Proposed Development will result in negative impacts to GCN, foraging and commuting bats and reptiles. However, mitigation measures are recommended to prevent an offence under the relevant legislation from occurring, and to avoid / reduce the risk of development proposals resulting in significant effects on the populations of species recorded.

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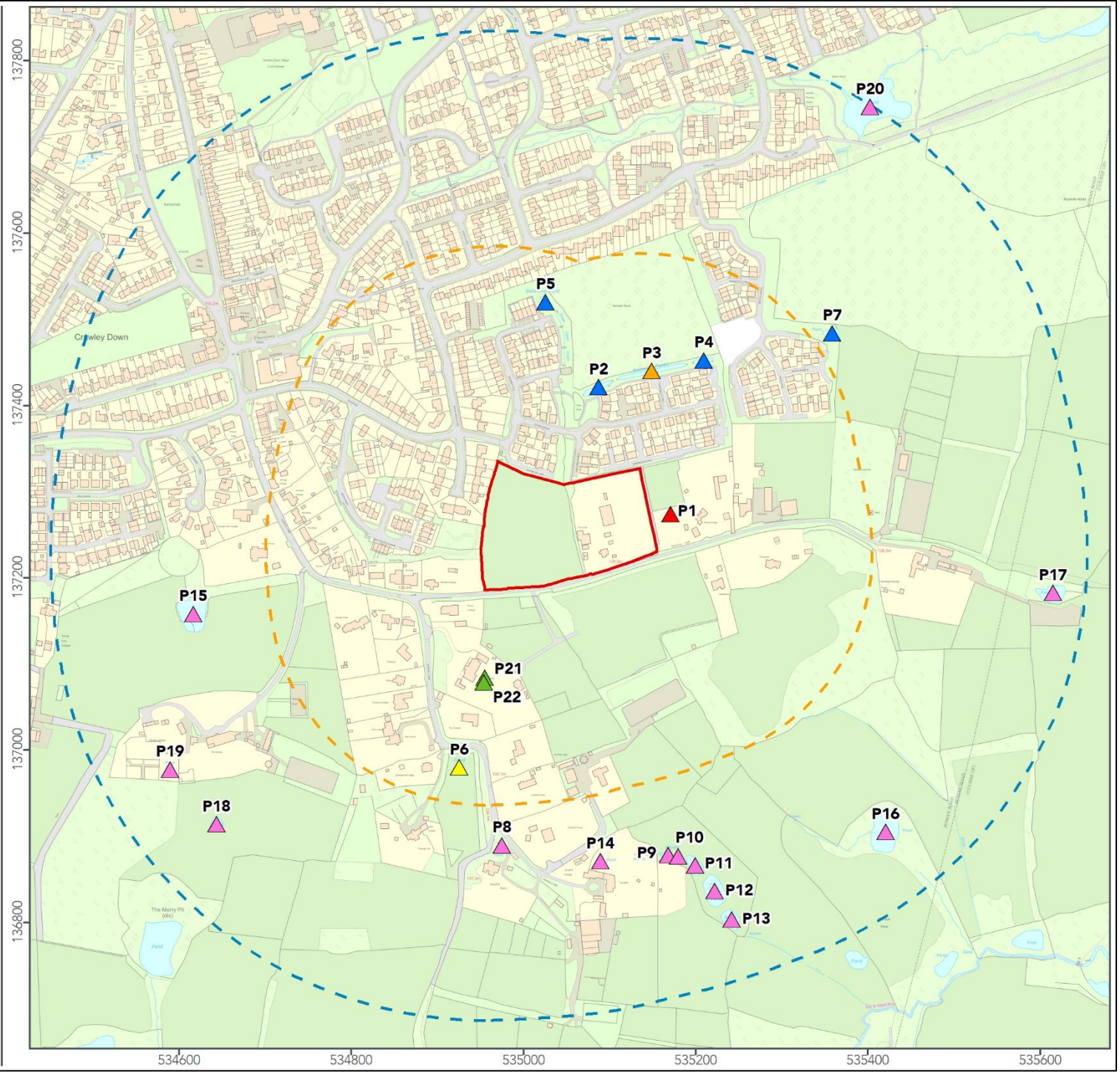
Appendix I: Pond Plan

Burleigh Lane, Crawley Down, West Sussex

- Survey area
- 250m buffer
- 500m buffer
- Dry
- Negative for GCN eDNA
- No access
- No pond present
- Positive for GCN eDNA
- Scoped out



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Date: Dec 2023 **Reviewed by:** NP

Drawing number:
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URBAN EDGE ENVIRONMENTAL CONSULTING
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Appendix II: eDNA Results for Ponds

NATURE METRICS
DNA-BASED MONITORING

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Your sample(s) have been processed in accordance with the protocol set out in Appendix 5 of Biggs et al. (2014). Results are based on the samples as supplied by the client to the laboratory. Incorrect sampling methodology may affect the results. Note that a negative result does not preclude the presence of GCN at a level below the limits of detection.

A results interpretation guide and a glossary of terms highlighted throughout this report can be found at the end of the report.

GCN Detection Results

Pond ID	Inhibition	Degradation	GCN Score	Result
604-4	No	No	0	Negative
604-2	No	No	0	Negative

Sample Information

Pond ID	Kit ID	Sampling Date	Received Date
604-4	GCN-23-01472	2023/06/28	2023/07/06
604-2	GCN-23-01471	2023/06/28	2023/07/06

Methods

eDNA was precipitated via centrifugation at 14,000 x g and then extracted using Qiagen DNeasy Blood and Tissue extraction kits. qPCR amplification was carried out in 12 replicates per sample, using GCN specific primers and probe (developed by Thomsen et al. (2012) and adopted by Biggs et al. (2014)), in the presence of extraction negative controls, qPCR positive controls, and qPCR negative controls. A score is given for the number of positive replicates out of 12.

The qPCR method follows the recommendations set out by NatureMetrics for Natural England in the qPCR validation project and helps improve the reliability of the interpretation of the data.

Results from the GCN assay are considered to have a high confidence rating according to our Validation Scale (Harper et al. 2021).

The quality control methods exceed the requirements outlined in Appendix 5 of Biggs et al. (2014). These consist of the use of kit blanks, additional extraction negative controls, qPCR negative controls,

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Your sample(s) have been processed in accordance with the protocol set out in Appendix 5 of Biggs et al. (2014). Results are based on the samples as supplied by the client to the laboratory. Incorrect sampling methodology may affect the results. Note that a negative result does not preclude the presence of GCN at a level below the limits of detection.

A results interpretation guide and a glossary of terms highlighted throughout this report can be found at the end of the report.

GCN Detection Results

Pond ID	Inhibition	Degradation	GCN Score	Result
604-5	No	No	0	Negative

Sample Information

Pond ID	Kit ID	Sampling Date	Received Date
604-5	GCN-23-00060	2023/06/28	2023/07/06

Methods

eDNA was precipitated via centrifugation at 14,000 x g and then extracted using Qiagen DNeasy Blood and Tissue extraction kits. qPCR amplification was carried out in 12 replicates per sample, using GCN specific primers and probe (developed by Thomsen et al. (2012) and adopted by Biggs et al. (2014)), in the presence of extraction negative controls, qPCR positive controls, and qPCR negative controls. A score is given for the number of positive replicates out of 12.

The qPCR method follows the recommendations set out by NatureMetrics for Natural England in the qPCR validation project and helps improve the reliability of the interpretation of the data.

Results from the GCN assay are considered to have a high confidence rating according to our Validation Scale (Harper et al. 2021).

The quality control methods exceed the requirements outlined in Appendix 5 of Biggs et al. (2014). These consist of the use of kit blanks, additional extraction negative controls, qPCR negative controls, and qPCR positive controls. Using these controls ensures assay performance is as expected and increases confidence in any weak or late amplifications.

The extraction and qPCR negative controls analysed alongside your samples showed no target

Thank you for choosing NatureMetrics

Welcome to your report. We are the leading provider of powerful, scalable biodiversity data delivered using environmental DNA.

Your sample(s) have been processed in accordance with the protocol set out in Appendix 5 of Biggs et al. (2014). Results are based on the samples as supplied by the client to the laboratory. Incorrect sampling methodology may affect the results. Note that a negative result does not preclude the presence of GCN at a level below the limits of detection.

A results interpretation guide and a glossary of terms highlighted throughout this report can be found at the end of the report.

GCN Detection Results

Pond ID	Inhibition	Degradation	GCN Score	Result
604-22	No	No	11	Positive
604-21	No	No	12	Positive
604-P7	No	No	0	Negative

Sample Information

Pond ID	Kit ID	Sampling Date	Received Date
604-22	GCN-23-02034	2023/06/28	2023/07/06
604-21	GCN-23-02030	2023/06/28	2023/07/06
604-P7	GCN-23-02033	2023/06/28	2023/07/06

Methods

eDNA was precipitated via centrifugation at 14,000 x g and then extracted using Qiagen DNeasy Blood and Tissue extraction kits. qPCR amplification was carried out in 12 replicates per sample, using GCN specific primers and probe (developed by Thomsen et al. (2012) and adopted by Biggs et al. (2014)), in the presence of extraction negative controls, qPCR positive controls, and qPCR negative controls. A score is given for the number of positive replicates out of 12.

The qPCR method follows the recommendations set out by NatureMetrics for Natural England in the qPCR validation project and helps improve the reliability of the interpretation of the data.

1

Appendix III: Bat Activity Transect Route and Static Detector Locations

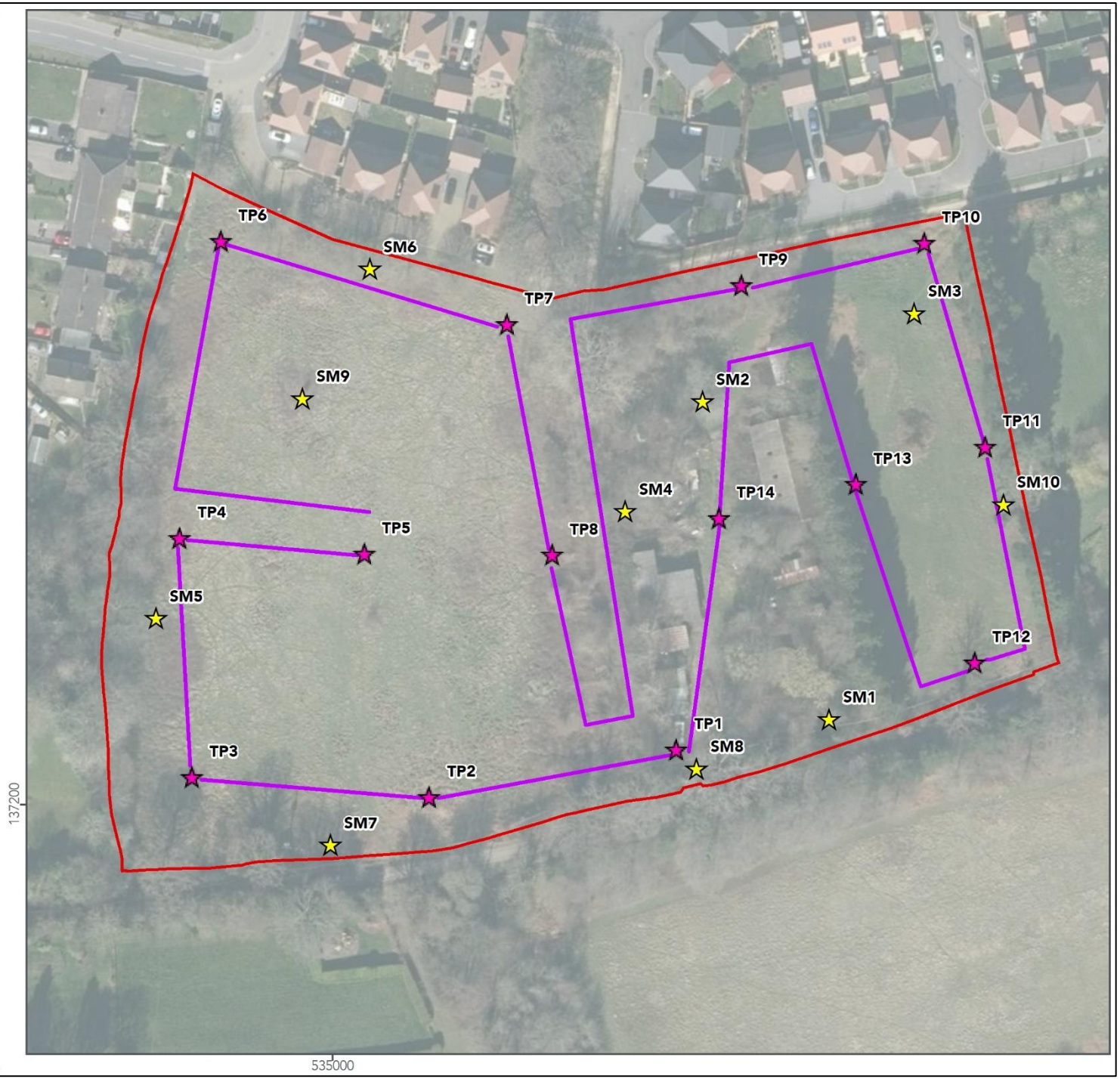
Burleigh Lane, Crawley Down, West Sussex

Survey area

Bat survey line

Bat detector

Transect point



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Date: Dec 2023 **Reviewed by:** NP

Drawing number:

UE0604ECO-BurleighLane_PSR_231220

URBAN EDGE ENVIRONMENTAL CONSULTING

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Appendix IV: Bat Activity Survey Results

Abbreviations:

MYSP	Myotis sp	NYNO	. Noctule	PIPI	Common pipistrelle
PIPY	Soprano pipistrelle	PISP	Pipistrelle sp.	PLAU	Brown long-eared

Survey 1: Dusk, 31/05/2023					
Surveyor: DM, RE					
Sunset/sunrise:	**Start time:**	**End time:**	**Precipitation:**	**Moon Phase:**	
21:04	21:04	23:04	None	First quarter	
Air temp start:	**Air temp end:**	**Wind Start:**	**Wind Finish**	**Cloud start:**	**Cloud finish:**
13°C	11°C	5B	5B	90%	100%
Equipment: Anabat scout full spectrum detector					

Transect Point (TP)	**From**	**Time**	**Length (mins)**
1	21:04	21:09	5
2	21:11	21:16	5
3	21:18	21:23	5
4	21:25	21:30	5
5	21:31	21:36	5
6	21:38	21:43	5
7	21:45	21:50	5
8	21:52	21:58	5
9	22:05	22:10	5
10	22:12	22:17	5
11	22:19	22:25	5
12	22:27	22:33	5
13	22:37	22:42	5
14	22:44	22:50	6
2	22:53	22:58	5

TP: Transect point Time: of recording and/or time at transect point No.(I): Number of bats

No.(P): Number of passes E/R: emergence/re-entry F/C: Foraging/commuting Soc.: Social calls

S/NS/SNH: Seen / not seen / seen not heard Comment: e.g. location of roost, direction of flight, behaviour, frequency, call shape

Bat activity. Start at: TP1								
TP	**Time**	**Spp.**	**No.(I)**	**No.(P)**	**F/C**	**Soc.**	**S/NS**	**Comment**
3	21:20	PIPI	1	1			NS	Quiet, short

Bat activity. Start at: TP1								
TP	**Time**	**Spp.**	**No.(I)**	**No.(P)**	**F/C**	**Soc.**	**S/NS**	**Comment**
	21:22	PIPI	1	1			NS	
6	21:39	PIPI	1	1			NS	
7	21:46	PIPI	1	1			NS	
8-9	21:57	PLAU	1	1			NS	Brief
10	22:16	PIPI	1	1			NS	Very faint
12	22:29	MYSP	1	1			NS	Brief
12-13	22:33	PIPI						
	22:34	PIPI	1	1			NS	Faint
14	22:45	PIPI	1	1			NS	Loud
	22:47	PIPY	1	2			NS	
	22:48	PIPI	1	4			NS	Faint
	22:49	PIPI	1	3			NS	
	22:50	PLAU	1	1			NS	
	22:50	PIPY	1	3			NS	

Survey 2: Dusk, 28/06/2023					
Surveyor: RE, ZB					
Sunset/sunrise:	**Start time:**	**End time:**	**Precipitation:**	**Moon Phase:**	
21:19	21:19	23:19	None	First quarter	
Air temp start:	**Air temp end:**	**Wind Start:**	**Wind Finish**	**Cloud start:**	**Cloud finish:**
19°C	16°C	0B	1B	90%	100%
Equipment: Anabat scout full spectrum detector					

Transect Point (TP)	**From**	**Time**	**Length (mins)**
1	21:19	21:24	5
2	21:27	21:32	5
3	21:35	21:40	5
4	21:42	21:47	5
5	21:50	21:55	5
6	21:58	21:55	5
7	22:07	22:12	5
8	22:19	22:24	5
9	22:28	22:33	5
10	22:36	22:41	5

Survey 2: Dusk, 28/06/2023			
Surveyor: RE, ZB			
11	22:45	22:50	5
12	22:56	23:01	5
13	23:04	23:09	5
12	23:12	23:17	5

TP: Transect point Time: of recording and/or time at transect point No.(I): Number of bats

No.(P): Number of passes E/R: emergence/re-entry F/C: Foraging/commuting Soc.: Social calls

S/NS/SNH: Seen / not seen / seen not heard Comment: e.g. location of roost, direction of flight, behaviour, frequency, call shape

Bat activity. Start at: TP1								
TP	**Time**	**Spp.**	**No.(I)**	**No.(P)**	**F/C**	**Soc.**	**S/NS**	**Comment**
3	21:35	-	1				S	Seen not heard, Flying south-west over hedge
6-7	22:05	PIPI	1	1			NS	Brief
7	22:10	PIPI	1	1			NS	Brief
7-8	22:17	PIPI	1	3			NS	Distant
9-10	22:36	PIPI		1			NS	Brief
13	23:08	PIPI	1	2			NS	Brief and distant
12-13	23:10	PIPI	1	2			NS	Brief

Survey 3: 20/07/2023 Dusk,					
Surveyor: DM, ZB					
Sunset/sunrise:	**Start time:**	**End time:**	**Precipitation:**	**Moon Phase:**	
21:04	21:04	22:04	None	New moon	
Air temp start:	**Air temp end:**	**Wind Start:**	**Wind Finish**	**Cloud start:**	**Cloud finish:**
19°C	17°C	1B	1B	100%	100%
Equipment: Anabat scout full spectrum detector					

Transect Point (TP)	**From**	**Time**	**Length (mins)**
1	21:04	21:10	-
14	21:11	21:17	
13	21:20	21:26	
12	21:27	21:33	
11	21:34	21:40	
10	21:42	21:48	
9	21:50	21:56	

Survey 3: 20/07/2023 Dusk,			
Surveyor: DM, ZB			
7	21:58	22:04	
6	22:07	22:13	
4	22:15	22:22	
5	22:24	22:31	
3	22:34	22:41	
2	22:44	22:50	
8	22:52	22:58	
1	22:02	22:04	

TP: Transect point Time: of recording and/or time at transect point No.(I): Number of bats
No.(P): Number of passes E/R: emergence/re-entry F/C: Foraging/commuting Soc.: Social calls
S/NS/SNH: Seen / not seen / seen not heard Comment: e.g. location of roost, direction of flight, behaviour, frequency, call shape

Bat activity. Start at: TP1								
TP	**Time**	**Spp.**	**No.(I)**	**No.(P)**	**F/C**	**Soc.**	**S/NS**	**Comment**
13	21:06	PIPI	1	2	F		NS	
12	21:27	PIPI	1	2	F		S	Foraging around trees
	21:29	PIPI	1	1	C		NS	Faint
	21:30	PIPI	1	2	F		NS	
	21:31	PIPI	1	3	F		S	Foraging around trees
10	22:42	PIPI	1	1	C		NS	Faint
	22:46	PIPI	1	2	F		NS	
		PIPI	1	1	F		NS	
9	21:47	PIPI	1	1	F		NS	Loud
6	22:10	PIPI	1	1	F		NS	
4	22:20	PIPI	1	3	F		NS	Faint
	22:21	PIPI	1	1	C		NS	Faint
	22:22	PIPI	1	2	F		NS	
3	22:36	PIPI	1	1	F		NS	Feeding buzz
	22:38	PIPI	1	1	C		NS	
2	22:49	PIPI	1	1	C		NS	
8	22:56	PIPI	1	1	C		NS	
1	22:03	PIPI	1	3	F		S	Around entrance

Survey 4: Dusk, 23/08/2023					
Surveyor: NP					
Sunset/sunrise:	**Start time:**	**End time:**	**Precipitation:**	**Moon Phase:**	
20:06	20:06	22:07	Light-Mod	Waxing	
Air temp start:	**Air temp end:**	**Wind Start:**	**Wind Finish**	**Cloud start:**	**Cloud finish:**
20°C	19°C	0B	0B	20%	100%
Equipment: BatLogger M2 full spectrum detector					

Transect Point (TP)	**From**	**Time**	**Length (mins)**
2	20:06	20:13	7
3	10:15	20:22	7
4	20:24	20:31	7
6	20:34	20:41	7
5	20:42	20:49	7
7	20:51	20:58	7
8	21:14	21:21	7
9	21:28	21:35	7
10	21:39	21:46	7
11	21:48	21:55	7
12	21:56	22:03	7
13	22:05	22:07	2 (rain stopped survey)

TP: Transect point Time: of recording and/or time at transect point No.(I): Number of bats
No.(P): Number of passes E/R: emergence/re-entry F/C: Foraging/commuting Soc.: Social calls
S/NS/SNH: Seen / not seen / seen not heard Comment: e.g. location of roost, direction of flight, behaviour, frequency, call shape

Bat activity. Start at: TP2								
TP	**Time**	**Spp.**	**No.(I)**	**No.(P)**	**F/C**	**Soc.**	**S/NS**	**Comment**
2	20:06-20:10	PIPI	1	1	C		NS	
	20:12	PIPI	1	1	F		NS	
3	20:19	PIPY	1	1	C		NS	Distant
	20:20	PIPI	1	1	C		NS	Distant
	20:21	PIPI	1	1	C		NS	Close
6	20:39	PIPI	1	1	C		NS	
7	20:57	PIPI	1	1	F		NS	
8	-							c.15min rain delay
	21:10	PLAU	1	1	C		NS	
8-9	21:24-25	PIPI	?	10	F		NS	

Bat activity. Start at: TP2								
TP	**Time**	**Spp.**	**No.(I)**	**No.(P)**	**F/C**	**Soc.**	**S/NS**	**Comment**
9	21:28-31	PIPI	?	5	F		NS	
	21:31	PIPY	1	1	F	Y	NS	
	21:34	PIPI	1	3			NS	
10	21:44	PIPI	1	2	F		NS	
	21:45	PIPI	1	1			NS	
	21:46	PIPI	1	2	C		NS	
11	21:48	PIPI	1	3	C		NS	
12	21:56	MYSP	1	1	C		NS	Distant
	22:00-03	PIPI	?	16	F		NS	
13	-							Rain. Survey stopped

Survey 5: Dusk, 11/09/2023					
Surveyor: RE, JD					
Sunset/sunrise:	**Start time:**	**End time:**	**Precipitation:**	**Moon Phase:**	
19:25	19:25	21:25	None	Third quarter	
Air temp start:	**Air temp end:**	**Wind Start:**	**Wind Finish**	**Cloud start:**	**Cloud finish:**
20°C	18°C	1B	1B	20%	50%
Equipment: Anabat scout full spectrum detector					

Transect Point (TP)	**From**	**Time**	**Length (mins)**
1	19:25	19:30	5
2	19:32	19:37	5
3	19:39	19:44	5
4	19:46	19:51	5
5	19:53	19:58	5
6	20:00	20:05	5
7	20:06	20:11	5
8	20:18	20:23	5
9	20:24	20:29	5
10	20:31	20:36	5
11	20:39	20:44	5
12	20:46	20:51	5
13	20:55	21:00	5

Survey 5: Dusk, 11/09/2023			
Surveyor: RE, JD			
14	21:04	21:09	5
1	21:14	21:19	5
2	21:20	21:25	5

TP: Transect point Time: of recording and/or time at transect point No.(I): Number of bats
No.(P): Number of passes E/R: emergence/re-entry F/C: Foraging/commuting Soc.: Social calls
S/NS/SNH: Seen / not seen / seen not heard Comment: e.g. location of roost, direction of flight, behaviour, frequency, call shape

Bat activity. Start at: TP1								
TP	**Time**	**Spp.**	**No.(I)**	**No.(P)**	**F/C**	**Soc.**	**S/NS**	**Comment**
7-8	20:14	PIPI	1	5	F		NS	
8	20:20	PIPI	1	3	F		NS	
	20:22	PIPI	1	3	F		NS	
9	20:24-26	PIPI	?	Cont.	F		NS	
1	21:14	PIPI	?	6	F		NS	
	21:19	PIPI	1	2	F			
2	21:24	PIPI	1	1			NS	Distant

Survey 6: Dawn, 12/09/2023					
Surveyor: RE, JD					
Sunset/sunrise:	**Start time:**	**End time:**	**Precipitation:**	**Moon Phase:**	
06:30	04:30	06:30	Light	Third quarter	
Air temp start:	**Air temp end:**	**Wind Start:**	**Wind Finish**	**Cloud start:**	**Cloud finish:**
16°C	16°C	2B	0B	80%	100%
Equipment: Wildlife Acoustics EchoMeter Touch2 Pro full spectrum detector					

Transect Point (TP)	**From**	**Time**	**Length (mins)**
1	04:30	04:36	6
14	04:38	04:44	6
13	04:46	04:52	6
12	04:54	05:00	6
11	05:02	05:08	6
10	05:10	05:16	6
9	05:18	05:24	6
8	05:30	05:36	6
7	05:38	05:44	6
6	05:46	05:52	6

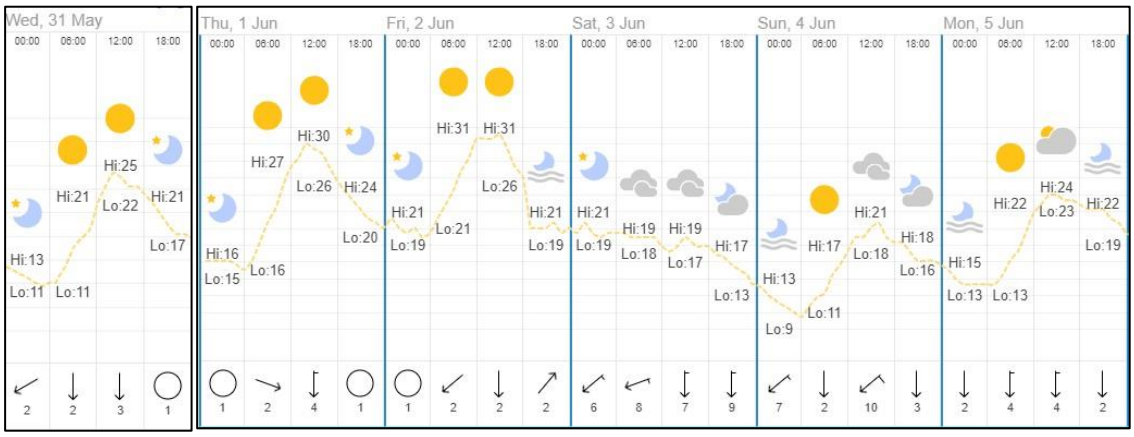
Survey 6: Dawn, 12/09/2023			
Surveyor: RE, JD			
5	05:54	06:00	6
4	06:00	06:06	6
3	06:08	06:14	6
2	06:16	06:22	6
1	06:24	06:30	6

TP: Transect point Time: of recording and/or time at transect point No.(I): Number of bats
No.(P): Number of passes E/R: emergence/re-entry F/C: Foraging/commuting Soc.: Social calls
S/NS/SNH: Seen / not seen / seen not heard Comment: e.g. location of roost, direction of flight, behaviour, frequency, call shape

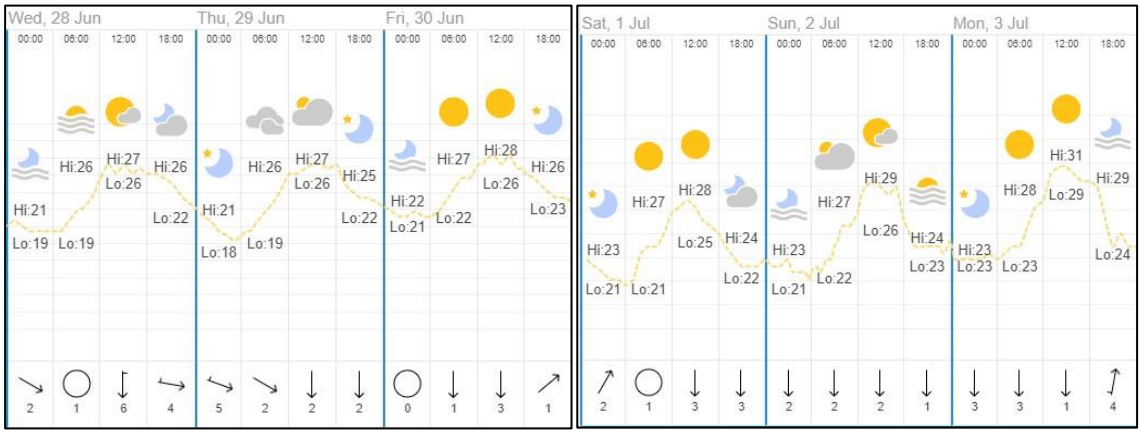
Bat activity. Start at: TP 1								
TP	**Time**	**Spp.**	**No.(I)**	**No.(P)**	**F/C**	**Soc.**	**S/NS**	**Comment**
13	04:46-51	PIPI	1	3	C		NS	Brief
12	04:59	PIPI	1	1	C		NS	Brief
10	05:13	PIPI	1	1	C			Brief
9	05:20	PIPI					NS	
	05:21	MYSP	1					
	05:22	PIPY	1	2			NS	
9-8	05:24	Bat	1				NS	
	05:26	Owl						Tawny in tree to north
	05:27	PIPY					NS	
8	05:36	PIPI	1	1	C		NS	Brief. Slight precipitation
7	05:39	Bat	1	3				
	05:44	PIPY	1	Cont.			NS	Light rain
6	-							Rain stopped
5	05:56	PIPI	1	1	C		NS	
4	06:01	PIPI	1	1	C		NS	
	06:04	PIPI	1	1	C		NS	Distant
3	06:09-10	PIPI	2	3	F		S	Foraging around northern hedgerow Light precipitation

Appendix V: Bat Weather Data

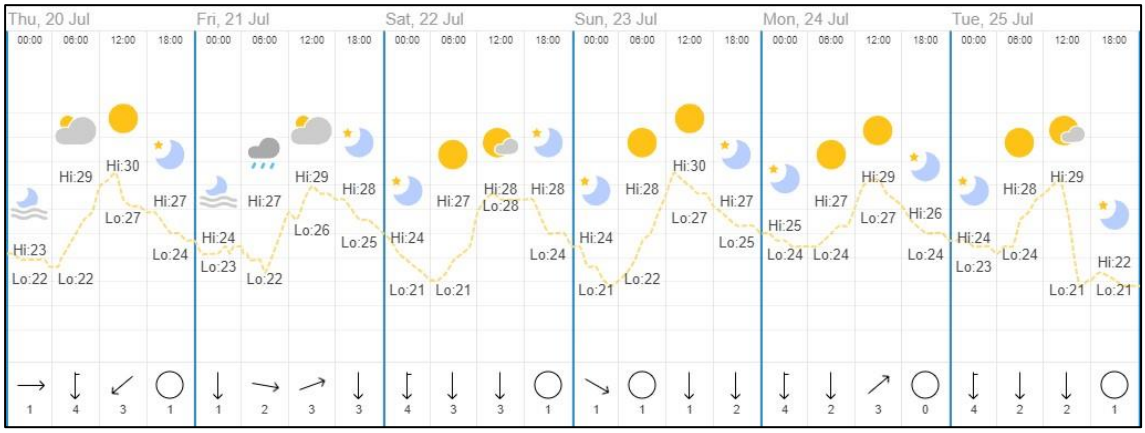
May



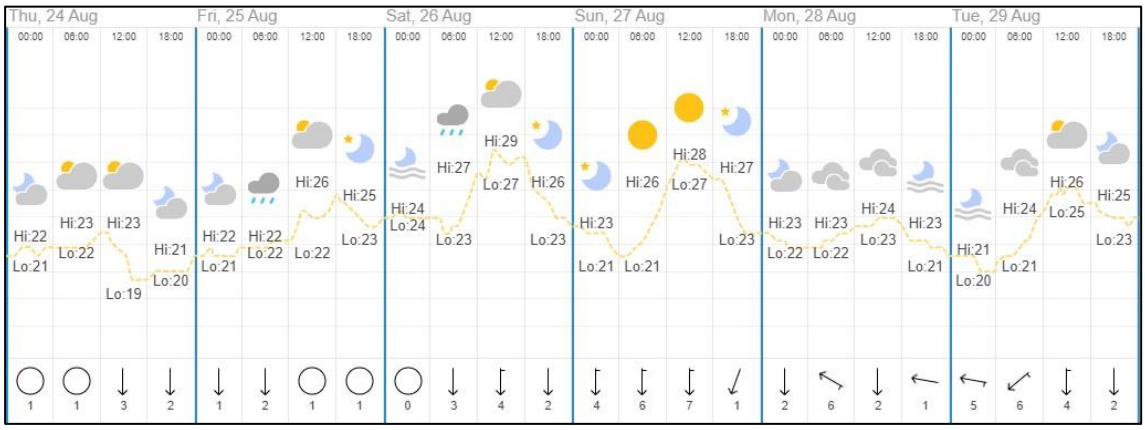
June



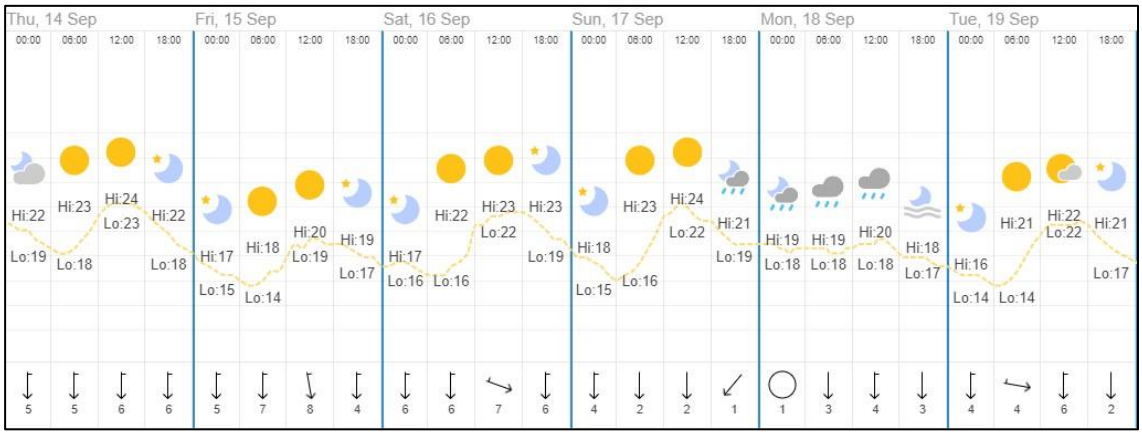
July



August



September



Appendix VI: Hazel Dormouse Survey Plan

Burleigh Lane, Crawley Down, West Sussex

- Survey area
- Dormouse tubes
- Dormouse nest tube
- Other mouse species

0 30 60

Metres

N

Scale (at A4): 1:1,200 **Created by:** EM

Date: Dec 2023 **Reviewed by:** NP

Drawing number:

UE0604ECO-BurleighLane_PSR_231220

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Appendix VII: Reptile Survey Plan

Burleigh Lane, Crawley Down, West Sussex

Survey area

Reptile mats

Grass snake

0 30 60

Metres

N

Scale (at A4): 1:1,200 **Created by:** EM

Date: Dec 2023 **Reviewed by:** NP

Drawing number:

UE0604ECO-BurleighLane_PSR_231220

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Appendix VIII: Legislation and Planning Context

Legislation

General

The main legislative instruments for ecological protection in England and Wales are: the Wildlife and Countryside Act 1981 (WCA; as amended); Countryside and Rights of Way Act 2000 (CRoW; as amended); Natural Environment and Rural Communities Act 2006 (NERC; as amended); the Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations; as amended); and the Environment Act 2021.

WCA 1981 consolidated and amended pre-existing national wildlife legislation in order to implement the Bern Convention and the European Union Wild Birds Directive (Council Directive 2009/147/EC). It complements the Habitats Regulations, offering protection to a wider range of species than the latter. The Act also provided for the designation and protection of nationally important conservation sites of value for their floral, faunal or geological features, termed Sites of Special Scientific Interest (SSSI). Schedules of the act list protected species of flora and fauna, as well as invasive species, and detail the possible offences that apply to these species.

The CROW Act 2000 amended and strengthened existing wildlife legislation detailed in the WCA. It placed a duty on government departments & the National Assembly for Wales to have regard for biodiversity, provided increased powers for the protection and maintenance of SSSI, and created a right of access to parts of the countryside. The Act contained lists of habitats and species (Section 74) for which conservation measures should be promoted, in accordance with the recommendations of the Convention on Biological Diversity (Rio Earth Summit) 1992.

The NERC Act 2006 consolidated and replaced aspects of earlier legislation. Section 40 of the Act places a duty upon all local authorities and public bodies in England and Wales to have regard to the purpose of conserving biodiversity in exercising all of their functions, including by restoring or enhancing habitats and species populations. Sections 41 (England) and 42 (Wales) list habitats and species of principal importance to the conservation of biodiversity (otherwise known as priority habitats/species as listed in the now superseded UK Biodiversity Action Plan). These lists supersede Section 74 of the CRoW Act 2000. These species and habitats are a material consideration in the planning process.

The Habitats Regulations 2017 are the principal means by the European Union Habitats Directive (Council Directive 92/43/EEC) was transposed into English and Welsh law, and place a duty upon the relevant authority of government to identify sites which are of importance to the habitats and species listed in Annexes I and II of the Habitats Directive. Those sites which meet the criteria in Europe are designated as Sites of Community Importance by the European Commission, and subsequently identified as Special Areas of Conservation (SAC) by the European Union member states. Since the UK's departure from the European Union the European Commission no longer has a role in designating SACs in the UK. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 establish a single stage designation process, where the appropriate authority is the decision maker. The selection and designation of SACs is based on the criteria set out in Annex III of the Habitats Directive insofar as it applies to the UK, and having regard to the advice of the appropriate nature conservation body.

The 2019 Amendment Regulations have created a new national site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes existing SACs, existing Special

Protection Areas (SPA) originally designated as a result of Council Directive 2009/147/EC on the Conservation of Wild Birds, and any new SACs and SPAs designated under the 2019 Regulations. SACs and SPAs in the UK therefore no longer form part of the EU's Natura 2000 ecological network.

The Habitats Regulations also provide for the protection of individual species of fauna and flora of European conservation concern listed in Schedules 2 and 5 respectively (European Protected Species (EPS)). Schedule 2 includes species such as otter and GCN for which the UK population represents a significant proportion of the total European population. It is an offence to deliberately kill, injure, disturb or trade in these species. Schedule 5 plant species are protected from unlawful destruction, uprooting or trade under the regulations. Under the Habitats Regulations disturbance includes any activity which is likely to: impair the ability of a EPS to survive, breed, reproduce, or rear/nurture its young; impair the ability of a EPS to migrate or hibernate; or significantly affect the local distribution or abundance of the species.

The Environment Act 2021, among other things: established an Office for Environmental Protection; introduced a mandatory requirement for all new development requiring planning permission to achieve a net gain for biodiversity of at least 10% (although implementation of this is transitionary); amended the NERC Act duty to conserve biodiversity by explicitly adding a duty to enhance; and requires local authorities to produce local nature recovery strategies.

Bats (Chiroptera)

Bats and their roosts are fully protected by protected by the WCA and the Habitats Regulations, and seven species of bats are species of principal importance. The legislation makes it an offence, *inter alia*, to:

- Intentionally kill, injure or take a bat.
- Possess or control a live or dead bat, any part of a bat, or anything derived from a bat.
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place that a bat uses for shelter or protection. This is taken to mean all bat roosts whether bats are present or not.
- Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection.
- Make a false statement in order to obtain a licence for bat work.

Under the Habitats Regulations disturbance includes any activity which is likely to:

- Impair the ability of a bat to survive, breed, reproduce, or rear/nurture its young.
- Impair the ability of a bat to migrate or hibernate.
- Significantly affect the local distribution or abundance of the species.

Dormouse (Muscardinus avellanarius)

Dormouse is fully protected by the WCA and the Habitats Regulations. The legislation makes it an offence, *inter alia*:

- Intentionally kill, injure or take a dormouse.
- Possess or control a live or dead dormouse, any part of, or anything derived from a dormouse.
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place that a dormouse uses for shelter or protection.

- Intentionally or recklessly disturb a dormouse while it is occupying a structure or place that it uses for shelter or protection.
-

GCN (Triturus cristatus; GCN) (and natterjack toad Bufo calamita)

GCN is fully protected by the WCA and the Habitats Regulations. The legislation makes it an offence, *inter alia*, to:

- Intentionally kill, injure or take a GCN (including its eggs).
- Possess or control a live or dead GCN, any part of, or anything derived from a GCN.
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place that a GCN uses for shelter or protection.
- Intentionally or recklessly disturb a GCN while it is occupying a structure or place that it uses for shelter or protection.

Reptiles

The four common species (slow worm *Anguis fragilis*, common lizard *Zootoca vivipara*, adder *Vipera berus* and grass snake *Natrix helvetica*) are partially protected under the WCA. They are protected, *inter alia*, against intentional killing and injuring. The handling and translocation of these reptiles does not require a licence.

Smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis* are fully protected by the WCA and the Habitats Regulations. The legislation makes it an offence, *inter alia*, to:

- Intentionally kill, injure or take a smooth snake or sand lizard.
- Possess or control a live or dead smooth snake or sand lizard, any part of, or anything derived from a smooth snake or sand lizard.
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place that a smooth snake or sand lizard uses for shelter or protection.
- Intentionally or recklessly disturb a smooth snake or sand lizard while it is occupying a structure or place that it uses for shelter or protection.

Planning context

National Planning Policy Framework (Section 15: Conserving and enhancing the natural environment)

The National Planning Policy Framework (NPPF), published in 2023, outlines the Government's commitment to the conservation of wildlife and natural features. It is concerned with:

- Protecting and enhancing valued landscapes, sites of biodiversity or geological conservation value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
- Maintaining the character of the undeveloped coast, while improving public access to it where appropriate;
- Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current & future pressures;

- Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
- Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

The NPPF requires that local plans should "distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value…; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scape across local authority boundaries".

To protect and enhance biodiversity and geodiversity, the NPPF states that planning policies should:

- Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

When determining planning applications, local planning authorities should aim to protect and enhance biodiversity by applying the following principles:

- if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

The following wildlife sites should be given the same protection as habitats sites:

- potential Special Protection Areas and possible Special Areas of Conservation;
- listed or proposed Ramsar sites; and

- sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects) unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site. The policies within the NPPF (and additional guidance contained within Circular 06/2005) are a material planning consideration.

UK/Local Biodiversity Action Plan Designations and Birds of Conservation Concern and Red Data Book Listings

Note that BAP designations and status as RSPB Birds of Conservation Concern or Red Data Book species does not offer any further legal protection, but planning authorities are required to prevent these species from being adversely affected by development in accordance with National Planning Policy and the CROW and NERC Acts. The United Kingdom Biodiversity Action Plan (UKBAP), first published in 1994 and updated in 2007, was a government initiative designed to implement the requirements of the Convention of Biological Diversity to conserve and enhance species and habitats. The UKBAP contained a list of priority habitats and species of conservation concern in the UK, and outlined biodiversity initiatives designed to enhance their conservation status.

However, as a result of devolution, and new country-level and international drivers and requirements, much of the work previously carried out by the UK BAP is now focussed at a country-level rather than a UK-level, and the UK BAP was succeeded by the 'UK Post-2010 Biodiversity Framework' in July 2012. The UK lists of priority habitats and species nonetheless remain an important reference source and were used to draw up statutory lists of priority habitats and species in England, Northern Ireland, Scotland and Wales. The priority habitats and species correlate with those listed on Section 41 and 42 of the NERC Act.

The UKBAP required that conservation of biodiversity be addressed at a County level through the production of Local BAPs. These are targeted towards species of conservation concern characteristic of each area. In addition, a number of local authorities and large organisations have produced their own BAPs. Where they exist, Local BAP targets with regard to species and habitats are a material consideration in the planning process.

Local Planning Policy

The Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, March 2018) contains the following policy relating to wildlife and biodiversity:

DP38 – Biodiversity

"Biodiversity will be protected and enhanced by ensuring development:

- *Contributes and takes opportunities to improve, enhance, manage and restore biodiversity and green infrastructure, so that there is a net gain in biodiversity, including through creating new designated sites and locally relevant habitats, and incorporating biodiversity features within developments; and*
- *Protects existing biodiversity, so that there is no net loss of biodiversity. Appropriate measures should be taken to avoid and reduce disturbance to sensitive habitats and species. Unavoidable damage to biodiversity must be offset through ecological enhancements and mitigation measures (or compensation measures in exceptional circumstances); and*
- *Minimises habitat and species fragmentation and maximises opportunities to enhance and restore ecological corridors to connect natural habitats and increase coherence and resilience; and*

- *Promotes the restoration, management and expansion of priority habitats in the District; and*
- *Avoids damage to, protects and enhances the special characteristics of internationally designated Special Protection Areas, Special Areas of Conservation; nationally designated Sites of Special Scientific Interest, Areas of Outstanding Natural Beauty; and locally designated Sites of Nature Conservation Importance, Local Nature Reserves and Ancient Woodland or to other areas identified as being of nature conservation or geological interest, including wildlife corridors, aged or veteran trees, Biodiversity Opportunity Areas, and Nature Improvement Areas"*

Appendix IX: Legal and Technical Limitations

- This report has been prepared by Urban Edge Environmental Consulting Ltd (UEEC Ltd) with all reasonable skill, care and diligence within the terms of the contract made with the Client to undertake this work, and taking into account the information made available by the Client. No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by us.
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- The advice provided in this report does not constitute legal advice. As such, the services of lawyers may also be considered to be warranted.
- Unless otherwise stated in this report, the assessments made assume that the sites and facilities that have been considered in this report will continue to be used for their current planned purpose without significant change.
- All work carried out in preparing this report has utilised and is based upon UEEC Ltd's current professional knowledge and understanding of current relevant UK standards and codes, technology and legislation. Changes in this legislation and guidance may occur at any time in the future and may cause any conclusions to become inappropriate or incorrect. UEEC Ltd does not accept responsibility for advising the Client or other interested parties of the facts or implications of any such changes;
- Where this report presents or relies upon the findings of ecological field surveys (including habitat, botanical or protected/notable species surveys), its conclusions should not be relied upon for longer than a maximum period of two years from the date of the original field surveys. Ecological change (e.g. colonisation of a site by a protected species) can occur rapidly and this limitation is not intended to imply that a likely absence of, for instance, a protected species will persist for any period of time;
- This report has been prepared using factual information contained in maps and documents prepared by others. No responsibility can be accepted by UEEC Ltd for the accuracy of such information;
- Every effort has been made to accurately represent the location of mapped features, however, the precise locations of features should not be relied upon;
- Populations of animals and plants are often transient in nature and a single survey visit can only provide a general indication of species present on site. Time of year when the survey was carried out, weather conditions and other variables will influence the results of an ecological survey (e.g. it is possible that some flowering plant species which flower at other times of the year were not observed). Every effort has been made to accurately note indicators of presence of protected, rare and notable species within and adjacent to the site but the possibility nonetheless exists for other species to be present which were not recorded or otherwise indicated by the survey;
- Any works undertaken as a consequence of the recommendations provided within this report should be subjected to the necessary health & safety checks and full risk assessments.

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