Cove Communities

Medmerry Holiday Park

Bat Survey Report 2023

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EXECUTIVE SUMMARY

This report presents the results of a suite of bat surveys carried out in connection with the proposed re-development of existing holiday lodges throughout the Medmerry holiday park, Stoney Ln, Chichester, PO20 7JP (Central grid reference: SZ 82011 95765).

The survey results presented in this report includes a desk-based review and a number of field surveys completed in 2023 to inform the Proposed Development, specifically:

- a desk-based review of previous on-site surveys and records of bats within 1 km of the Site boundaries;
- a Ground Level Tree Assessment (GLTA) for potential roosting features for bats;
- static detector monitoring surveys to identify species, levels of activity, and any key foraging and commuting areas within the Site;
- emergence surveys on Phase 1 of the development (shown in blue on *Figure 2*); and
- bat activity surveys involving dawn walked transects to identify any swarming activity which may indicate roosting behaviour in the Phase 1 area of the development.

The GLTA identified 41 trees on the Site with bat roosting potential.

Buildings within the 2023 survey boundary (Phase 1 of the development) were split into three groups, namely: Building Group 1, Building Group 2 and Building Group 3 (*Figure 3*). These building groups were subject to emergence surveys.

No evidence was recorded of bats emerging or re-entering any of the buildings within Phase 1 of the development.

At least nine species of bat were recorded during the static detector surveys comprising; *Myotis* species, noctule, Leisler's bat, serotine, common pipistrelle, soprano pipistrelle, Nathusius's pipistrelle, barbastelle and long-eared bat species.

Common pipistrelle dominated the recordings overall (64.60%) and across all static locations. This was followed by soprano pipistrelle (26.51%), barbastelle (5.27%) and serotine (1.72%).

Although all species of bats are legally protected, barbastelle is afforded additional protection as an Annex II bat species (under the Habitats Directive) for which Special Areas of Conservation (SACs) may be designated. It is one of our rarer species, though probably under-recorded. Barbastelle was the third most commonly recorded species overall; however, it would seem unlikely that breeding colonies are present within a few km of the site.

Whilst common and soprano pipistrelle were recorded at every location on the Site and represented the highest number of registrations in every month of recording, this was not the case for locations on the western boundary of the site which was identified as a barbastelle commuting route potentially of County importance, apparently down to the beach. Much of the remaining habitat was of limited value to bats.

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1.0 INTRODUCTION

1.1 Purpose of this report

1.1.1 This report presents the results of a suite of bat surveys at Medmerry Park, Stoney Lane, Chichester, PO20 7JP (Central grid reference: SZ 82011 95765) which is hereafter known as the 'the Site'. The assessment was undertaken to inform an Ecological Impact Assessment (EcIA) in relation to the proposed re-development of existing holiday lodges throughout the Site (hereafter known as the 'Proposed Development'). This assessment was completed by RSK Biocensus on behalf of Laister Planning Ltd.

1.1.2 ABPmer completed a suite of ecological surveys in relation to the Site between 2018 and 2019 to assess its ecological value and inform an assessment of effects associated with the construction of a previous iteration of the Proposed Development. The results of these surveys are now considered to be out of date and an update to the ecological baseline of the Site was required, so that potential impacts from the current Proposed Development could be accurately assessed.

1.1.3 The updated assessment survey area included the land within the red-line boundary (the Site) *as* shown in *Figure 1*. The development has been split into three phases as shown in *Figure* 2. For the GLTA and static monitoring surveys, the entire red line boundary was surveyed. Due to timing of the works and taking into account survey validity, emergence and transect surveys were completed on Phase 1 of the development only. Further surveys to investigate roosting bats in Phases 2 and 3 are recommended in 2024 and 2025 respectively.

1.1.4 The survey results presented in this report are as follows:

- A desk-based review of previous surveys and records of bats within 1 km of the Site boundaries;
- A Ground Level Tree Assessment (GLTA) for potential roosting features;
- Static detector monitoring surveys to identify bat species, levels of activity and key foraging and commuting areas;
- Emergence surveys on Phase 1 of the development (shown in blue on *Figure* 2); and,
- Bat activity surveys involving dawn walked transects to identify any swarming activity which might have indicated roosting behaviour within the Phase 1 area.

1.1.5 This report identifies ecological constraints relevant to the Proposed Development and forms an appendix to Chapter 7 of the Environmental Statement.

1.2 Landscape context

1.2.1 The Site is located to the south-east of the town of West Wittering along the southern coast of West Sussex. Within the wider area of the Site is Bracklesham Bay Site of Specific Scientific Interest (SSSI), Pagham Harbour Special Protection Area (SPA) and Ramsar site, Solent Maritime Special Area of Conservation (SAC) and Chichester and Langstone

Harbour SPA/Ramsar site, designated for their nationally and internationally important bird populations. The Site also lies within proximity to a number of other internationally and nationally designated sites important for wildlife (see Appendix 6.2). The wider landscape is primarily composed of grassland, arable land, residential areas, holiday parks and hedgerows. There is one pond within the Site to the west and ditches run parallel with sections of hedgerow throughout the edges of the field margins.

1.2 Survey validity

1.3.1 Distributions of habitats and species may be subject to change. As such, in line with Chartered Institute of Ecology and Environmental Management (CIEEM) guidance, the ecological survey data presented in this report are considered valid for at least two years (CIEEM, 2019), after which it may be necessary for further field surveys to be undertaken to update (or ground-truth) the ecological baseline conditions for the Site.

2.0 METHODS

2.1 Background data search

2023 surveys for roosting bats

2.1.1 In May 2023, RPS completed a Preliminary Roost Assessment (PRA) of all buildings on the Site. Of the 86 buildings, 18 were found to have high roost potential, 23 had moderate potential, 18 had low potential, with the remaining 27 offering negligible potential. The results of these surveys were used to inform the current suite of surveys.

Sussex Biodiversity Records Centre data

2.1.2 To provide supplementary data to inform this report, bat records for the Site and a 1 km buffer were obtained from Sussex Biodiversity Records Centre (SxBRC) in March 2023.

2.2 GLTA

2.2.1 An initial GLTA was undertaken for each tree that has the potential to be affected by the Proposed Development to investigate its potential for roosting bats. The survey was undertaken by RSK Principal Ecologist Daniel Fellman on 25 May 2023 and 01 June 2023. Daniel holds a Level 3 (2018-35857-CLS-CLS) bat survey licence.

2.2.2 The survey involved the inspection of trees from the ground using binoculars and a torch to identify any potential roosting features (PRFs), which bats could use for roosting and for any evidence of bats around or below the PRFs.

2.2.3 PRFs that may be used by bats include (amongst others):

- holes (e.g. woodpecker holes);
- cracks and splits (in trunks and limbs);
- cavities (e.g. formed by occluded stems or limbs);
- loose, flaking or folding bark;
- crevices formed by epicormic growth; and
- deadwood.

2.2.4 Signs indicating possible use of a PRF by bats include;

- staining around an entry point;
- bat droppings in, around or below an entry point;
- squeaking noises;
- flies around an entry point;
- a distinctive smell of bats, and
- smoothing of surfaces around a cavity.

2.2.5 For each PRF, the following information was recorded: tree species and location; feature description; and bat-roost potential categorisation in accordance with *Table 1*. Each feature was categorised according to BCT Good Practice Guidelines (Collins, 2016[1]). Trees with potential for roosting bats were mapped and target-noted.

2.2.6 It is worth noting that a confirmed roost does not infer 'high suitability' (which relates to the type of roost the PRF might support), nor does it infer 'high conservation status', which takes a number of factors including species into account.

Table 1. Categorisation of roosting habitats (adapted from Collins, 2016).

Category	Description
Negligible suitability	Negligible features on the Site likely to be used by roosting bats.
Low suitability	A tree with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and / or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate suitability	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely for a roost of high conservation status (with respect to roost type only 3 the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High suitability	A tree with one or more potential roost sites that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
Confirmed roost	Bats or evidence of bats recorded within the tree during the initial inspection surveys or during dusk/dawn surveys. A confirmed record (supplied by records centre/local bat group) would also apply.

2.2 Bat emergence surveys

Approach

2.3.1 Given the number of buildings on Site with some suitability for bats (see paragraph 2.1.1), emergence surveys on every building with bat roosting potential was not considered to be a proportionate approach. A systematic sampling approach was therefore adopted to gain

[1] An updated version has since been published (2023), but this was not available at the time of these surveys.

an insight into bat activity, locate activity hotspots and identify areas for further survey effort.

2.3.2 The suite of surveys within this report focused on Phase 1 of the proposed development (2023 survey boundary) (shown in *Figure* 2).

2.3.3 Buildings in the Phase 1 survey boundary were split into three groups, namely; Building Group 1, Building Group 2 and Building Group 3 (shown in *Figure* 3).

2.3.4 Building Group 1 comprises 3 high potential buildings, 1 moderate potential building, 2 low potential buildings and 2 negligible potential buildings.

2.3.5 Building Group 2 comprises 5 moderate potential buildings, 10 low potential buildings and 16 negligible potential buildings.

2.3.6 Building Group 3 comprises 5 high potential buildings and 4 moderate potential buildings.

2.3.7 For the first emergence survey on each building group, four surveyors were placed, one on each corner, with a static SM4 detector placed within the centre of the group (shown as surveyor location 5 on Figures 4-6), to give a good overall view of the area and identify any bat activity hotspots. Survey dates and surveyor locations are shown in Table 2 and Figures 4-6.

2.3.8 A static SM4 detector, shown as Detector 7 on *Figure* 8, was also deployed centrally within the Phase 1 survey boundary for the duration of the first emergence surveys to give an indication of activity within the central area of the phase 1 boundary. These detectors were used to show activity levels with the theory that any bats within this central location should be picked up by one of the surveyors on the corners and if not, it was possible that they could potentially have emerged from one of the buildings within the group.

Table 2. June emergence survey dates and surveyor locations

Building group	Date	Surveyor Locations
1	06/06/2023	1-4
2	07/06/2023	1-4
3	08/06/2023	1-4

2.3.9 Results from the first set of emergence surveys were used to inform the surveyor and static locations for the second set of emergence surveys; locations were focused on areas of bat activity. Survey dates and surveyor locations for the second tranche of surveys are shown in Table 3 and Figures 4-6.

Table 3. July emergence survey dates and surveyor locations.

Building group	Date	Surveyor Locations
1	11/07/2023	6-9
2	12/07/2023	6-9
3	13/07/2023	6-9

2.3.10 The low levels of bat activity from these two sets of surveys demonstrated that further emergence surveys would not provide additional significant information.

2.3.11 The third set of survey visits to Building Groups 1 and 2 was therefore conducted as dawn transects, the methodology for which can be found in Section 2.4 below.

2.3.12 Building Group 3 was not included in these transect surveys because no bat activity was recorded near any of the buildings during the first two surveys, and use of the buildings by bats could therefore adequately be assessed using the data from the two first two sets of surveys.

Methodology

2.3.13 Dusk emergence surveys were undertaken in accordance with the Bat Conservation Trust (BCT) Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins 2016)[1] and the BCT Interim Guidance Note: Use of night vision aids for bat emergence surveys and further comment on dawn surveys (BCT, 2022).

2.3.14 Emergence surveys commenced 15 minutes prior to sunset and continued for at least 1.5 hours after sunset (see *Table 4*).

2.3.15 All surveyors were equipped with bat detectors (EM Touch, Batlogger or Peersonic), to listen for the echolocation calls of bats as they emerged. All calls were recorded. If the identification of bats was in any doubt, these recordings were analysed using Kaleidoscope sound analysis software.

2.3.16 The surveys were carried out in weather suitable for bats to be active, i.e., no rain, no strong wind and sunset air temperature 10°C or above (see *Table 4)* and bat activity was heard on all occasions except on 11.07.2023. However, a bat was recorded on the static detector that was deployed at Location 10 on that date highlighting suitable weather conditions for bats to be active. A summary of the survey conditions is presented in *Table 4*.

Table 4. Emergence survey weather conditions

Date & building group	Sunset Time	Start Time/ End Time	Temperature (°C)	Wind (Beaufort)	Cloud (Octas)	Precipitation
06.06.2023	21:12	20:57/22:40	14	1	0	Nil
07.06.2023	21:12	20:57/22:40	16	1	1	Nil
08.06.2023	21:13	20:57/22:40	16	3	0	Nil
11.07.2023	21:14	20:59/22:45	18	3	6	Nil
12.07.2023	21:13	20:58/22:45	17	4	1	Nil
13.07.2023	21:12	20:57/22:45	18	3	4	Nil

2.2 Activity Surveys

Approach

2.4.1 Due to the building complexity on the Site as well as the relatively low number of bat recordings and species diversity during the June and July emergence surveys, the use of further emergence surveys was discounted as they would be unlikely to have provided any additional information to help gain an overview of bat roosting activity on the Site.

2.4.2 Therefore, a transect survey methodology was adapted to ensure the survey effort was appropriate for the Site and yielded insightful results. Using the June and July emergence survey results, the transect surveys aimed to identify key areas of bat activity and identify any swarming activity which could indicate a roost present on Site.

2.4.3 The dawn transect surveys involved walking the pre-determined routes covering Building Groups 1 and 2 (as shown in *Figure* 7).

2.4.4 Due to the limited bat activity recorded around Building Group 3 in the June and July emergence surveys, the use of transects was not deemed necessary.

Methodology

2.4.5 The surveys were carried out in accordance with the Bat Conservation Trust (BCT) good practice guidelines (Collins, 2016).

2.4.6 All surveys were undertaken as dawn transects. Each transect survey commenced two hours before sunrise and lasted until sunrise covering a route around Building Groups 1 and 2 to identify any swarming behavior.

2.4.7 On each visit, the set transect routes were walked in suitable weather (above 10°C with little or no rain and no strong winds), using an EM Touch, BatLogger M or BatLogger M2 handheld bat detector. Recordings of bat calls were made automatically by these detectors during the survey in full spectrum format, with coordinates assigned to each recording by

a GPS unit within the detector. The transect was walked repeatedly throughout the survey (c. 4-5 laps) to sample different parts of the Site at different times. Bat passes were marked on a map so that statistics on passes and numbers could later be calculated.

2.4.8 Levels of bat activity were quantified, with the detectors set to a maximum of 5 second recordings, allowing an approximation of one bat pass per species per file. Species were identified either in the field or through analysis of recordings.

2.4.9 *Table 5* details the dates, survey times and weather conditions for the activity surveys.

Table 5. Bat transect survey dates, times and weather conditions

Date	Sunrise Time	Start Time/ End Time	Temperature (°C)	Wind (Beaufort)	Cloud (Octas)	Precipitation
10.08.2023	05:42	03:40/05:42	14	1	1	Nil
11.08.2023	05:43	03:40/05:43	16	1	0	Nil

2.2 Static monitoring surveys

Approach

2.5.1 Six static detector locations were chosen for the first suite of static monitoring surveys undertaken between April and May 2023 (Locations 1-6 as shown in *Figure 8*).

2.5.2 Location 3 was abandoned after April and May as little bat activity was recorded here.

2.5.3 A further seven locations were subsequently highlighted as key areas to target to enable a comprehensive assessment of activity across the entire site.

2.5.4 The static detector at Location 7 (as shown in *Figure 8*) was only used during emergence surveys (i.e. for a shorter period of time than other detectors) to supplement that survey technique, so its results are not included in this section.

2.5.5 Location 9 was identified as a target location; however, this survey location could not be accessed.

2.5.6 Locations 1, 2, 4, 5, 6, 8 and 10-13 (*Figure* 8) were therefore the static locations used between June-October.

2.5.7 Two deployments of three static detectors were undertaken each month, giving a total of six locations per month.

2.5.8 Locations were selected on an iterative basis, using data from previous months to help target hot-spots for less common bat species.

Methodology

2.5.9 Wildlife Acoustics Song Meter 4 Bat+ (SM4) bat detectors were installed at three locations within the boundary of the Site during each month between April and October 2023, as shown in *Figure* 8 and *Table 6*. The detectors were placed alongside features typically used by foraging and commuting bats, such as hedgerows, tree lines and other linear features (ditches).

2.5.10 As per the Collins (2016) survey guidelines[1], static monitoring was undertaken for a period of at least five consecutive nights every month. The static detectors were set up to continuously record from 30 minutes before sunset until 30 minutes after sunrise. Survey dates were selected when the weather forecast indicated suitable weather conditions for foraging and commuting bats (i.e. air temperature above 8°C, the absence of strong winds and minimal precipitation). Typically, the static detectors were left to run longer than the required five-night period to compensate for any nights when conditions were unsuitable or sub-optimal for bats.

Table 6. Static detector deployment dates and locations

Month	Dates	Locations
April 2023	06.04.2023-12.04.2023	1,2,3
	19.04.2023-25.04.2023	4,5,6
May 2023	10.05.2023-15.05.2023	1,2,3
	15.05.2023-22.05.2023	4,5,6
June 2023	12.06.2023-20.06.2023	1,2,8
	20.06.2023-27.06.2023	4,5,6
July 2023	06.07.2023-11.07.2023	2, 11,12
	11.07.2023-17.07.2023	5, 10
	17.07.2023-24.07.2023	13
August 2023	08.08.2023-14.08.2023	2,11,12
	14.08.2023-21.08.2023	6,10,13
September 2023	11.09.2023-14.09.2023	2, 8,11
	18.09.2023-24.08.2023	2,4,5
October 2023	03.10.2023-09.10.2023	2,11,12
	09.10.2023-16.10.2023	1,6,10

2.2 Analysis of sound recordings

2.6.1 All recordings were stored onto memory cards and analysed using Kaleidoscope Viewer© software. All recordings were analysed using a number of processes:

- For static monitoring surveys only, initially all recordings were subject to batch-scrubbing to eliminate noise files. All identified noise files were subject to a 20% quality check for any bat calls that may have been missed by the software. Noise files were always split by nightly session to allow for weather variations. Results from this were either: noise processing was accurate; an error rate established and a correction to the figures was made, appropriate to the volume of noise calls, or noise files were included in full processing if the error rate was too high.
- All calls not scrubbed as noise (and all emergence survey and transect files) were subject to identification by an experienced ecologist. Call parameters such as call shape, inter-pulse interval, call length, frequency of maximum energy (peak frequency), and start and end frequency of the calls, were inspected to make an identification where possible.
- Echolocation calls were identified down to species or genus level depending on the type of bats encountered (i.e. it is often not possible to reliably identify species belonging to the *Myotis*, *Plecotus* and *Nyctalus* genera), and the quality of the recording.

2.2 Constraints and limitations

2.7.1 Static detectors cannot distinguish between large numbers of bats, and small numbers of bats making repeated passes. High levels of bat activity can be generated by a small number of foraging bats and individual bats close to a detector. This was considered during the interpretation of the survey results.

2.7.2 It is likely that the static detector at Location 5 failed in July as only eight files (all noise and no bats) were recorded which was uncharacteristically low for this location.

2.7.3 The static detector at Location 11 failed in August as no files were recorded.

2.7.4 In August, the static placed at Location 13 was interfered with by a member of the public. As a result, no recordings were made.

2.7.5 In September, the static detector at Location 2 failed during the first deployment. Due to the importance of this location as a commuting route for bats, it was decided that this static would be redeployed during the second September deployment and, as such, only five locations were investigated in September.

2.7.6 It is likely that the static detector at Location 2 failed in October as only 22 files (all noise and no bats) were recorded which was uncharacteristically low for this location.

2.7.7 Static Location 9 appeared to be a location that would have ideally been surveyed. However, this location could not be accessed in practice.

2.7.8 The approach of monitoring only certain locations at certain times was necessary to ensure the amount of data collected was proportionate and targeted. While this means that survey effort wasn't consistent between static locations, and not all locations were monitored at all times of the year, this has been taken into account during the interpretation of the results.

2.7.9 Echolocation calls were identified down to species wherever possible; however, depending on the type of bat encountered and call recorded, it is not always possible to reliably identify all bats beyond their genus. While presence/absence of different species in the genera

Myotis, *Plecotus*, and *Nyctalus* is now becoming easier to ascertain where high-quality calls have been collected, there are always calls where certainty is not possible, and therefore levels of bat activity by species (rather than genus) must be interpreted with a degree of caution.

2.7.10 Note that it can also be difficult to separate some calls of *Plecotus* bats as well as separating some *Plecotus* calls from *Myotis* bats. It can also be difficult to distinguish between the two bats in the *Nyctalus* genus, noctule (*N. noctula*) and Leisler's bat (*N. leisleri*), and occasionally those of serotine (*Eptesicus serotinus*). Some calls of common pipistrelle (*Pipistrellus pipistrellus*) also overlap with either Nathusius pipistrelle (*P. nathusii*) or soprano pipistrelle (*P.pygmaeus).* Analysis of cryptic calls can also be more difficult with faint or poor-quality recordings.

2.7.11 Bats in the *Plecotus* genus have been recorded as long-eared species and their calls have not been separated to species due to the difficulty separating out the calls of brown and grey long-eared bats. However, grey long-eared bats are very rare, even in southern England and the habitat here is sub-optimal for this species. No records were confirmed from the desk study.

2.7.12 Bats in the *Myotis* genus have been recorded as *Myotis* species and their calls have not been separated to species due to the difficulty in separating out the calls. Proportionately, relatively low numbers of *Myotis* calls were recorded, and the habitat is sub-optimal. These calls could be any one of the four more common species of *Myotis* but are relatively unlikely to represent more than one.

2.7.13 It should be noted that there are a number of variables that affect the detectability of a bat call, ranging from their biology and ecology, to the environmental conditions and condition of the equipment, and so there are limitations in drawing certain conclusions about bat activity on a site from the use of bat detectors / sound analysis alone. Given different detectabilities, from a few meters (for the quietest species such as brown long-eared bats) up to 100m (for noctule), the percentage distributions of calls detected should not be extrapolated to estimate abundance or compare levels of relative activity between species groups.

3.0 RESULTS

2.1 Background data search

3.1.1 The data search obtained from The Sussex Biodviersity Records Centre in March 2023 identified records of eight different bat species within 1 km of the Site boundaries, including:

- serotine (recorded most recently in 2017);
- *Myotis* species (recorded most recently in 2020);
- Daubenton's bat (recorded most recently in 2014);
- noctule (recorded in 2020);
- common pipistrelle (recorded in 2020);
- soprano pipistrelle (recorded in 2020); and,
- long-eared bat species (recorded in 2020).

2.2 GLTA

3.2.1 *Table 7* below details the results of the GLTA with photographs provided within Annex 1.

Table 7. Ground level tree assessment results

Bat Tree ID	Species	Age/DBH*	Safe to climb?	Features	Overall Tree Suitability
1	White poplar (*Populus alba*)	Semi mature / 50cm	Yes	Feature includes a basal cavity (Plate 1).	Low
2	White poplar (*Populus alba*)	Semi mature / 30cm	Yes	Feature includes a basal cavity (Plate 2).	Low
3	White poplar (*Populus alba*)	Semi mature / 60cm	Yes	White poplar with a cavity leading into the main stem (Plate 3).	Low
4	Apple (*Malus pumila*)	Immature / 40cm	Yes	One small cavity present which could fit an individual bat only (Plate 4).	Low
5	White poplar (*Populus alba*)	Semi mature / 40cm	Yes	Two small splits able to support individual bats only (Plate 5).	Low
6	White poplar (*Populus alba*)	Semi mature / 50cm	Yes	Bird box could provide PRF(Plate 6).	Low
7	White poplar (*Populus alba*)	Semi mature /40cm	Yes	Two low potential roosting features for bats including pruning wound and rams horning (Plate 7).	Low
8	White poplar (*Populus alba*)	Semi mature / 30cm	Yes	Bird box and pruning wound could provide PRF(Plate 8).	Low

Bat Tree ID	Species	Age/DBH*	Safe to climb?	Features	Overall Tree Suitability
9	White poplar (*Populus alba*)	Semi mature / 30cm	Yes	Hole leading into the main stem (Plate 9).	Low
10	White poplar (*Populus alba*)	Semi mature /40cm	Yes	Pruning wound and basal cavity (Plate 10).	Low
11	White poplar (*Populus alba*)	Semi mature /35cm	Yes	1 moderate and 1 low potential PRF. Both are wounds leading into potential internal cavities (Plate 11).	Moderate
12	Grey Willow (*Salix cinerea*)	Semi mature / 40cm	Yes	2 low potential splits in limbs (Plate 12).	Low
13	White Willow (*Salix alba*)	Semi mature /60cm	Yes	1 split in the main stem (Plate 13).	Low
14	Poplar (*Populus*) sp.	Semi mature /60cm	Yes	1 potential cavity on a limb c.6m in height (Plate 14).	Low
15	Poplar (*Populus*) sp.	Semi mature /50cm	Yes	1 potential cavity on limb too high to check from the ground.	Low
16	Poplar (*Populus*) sp.	Semi mature / 40cm	Yes	1 callus roll c. 12 m in height (Plate 15).	Low
17	Grey Willow (*Salix cinerea*)	Mature / 50cm	Yes	Basal cavity which could lead into the main stem.	Low

Bat Tree ID	Species	Age/DBH*	Safe to climb?	Features	Overall Tree Suitability
18	White poplar (*Populus alba*)	Semi mature / 40cm	Yes	Bird box could provide potential roosting feature. There is also a cavity (appears to be from a lost limb) which could provide a potential roost feature (Plate 16).	Low
19	Poplar (*Populus*) sp.	Semi mature /50cm	Yes	Pruning wound could lead into cavity large enough for individual bats.	Low
20	Poplar (*Populus*) sp.	Mature / 60cm	Yes	Pruning wound and small cavity between two stems (Plate 17).	Low
21	White poplar (*Populus alba*)	Semi mature /50cm	Yes	Bird box could provide PRF(Plate 18)	Low
22	White poplar (*Populus alba*)	Semi mature /60cm	Yes	2 woodpecker holes and 1 butt crevice (Plate 19) could lead into internal cavity.	Moderate
23	White poplar (*Populus alba*)	Mature /40cm	Yes	2 bird boxes could provide PRF(Plate 20).	Low
24	White poplar (*Populus alba*)	Mature /50cm	Yes	1 callus (Plate 21).	Low
25	White poplar (Populus alba)	Mature /40cm	Yes	1 birdbox which could provide PRFand 1 hazard beam (Plate 22).	Low
26	White poplar (*Populus alba*)	Semi mature /50cm	Yes	Rot hole c. 0.5 m in height (Plate 23) and 2 splits in the upper crown (Plate 24).	Low
27	Poplar (*Populus*) sp.	Semi mature /40cm	Yes	Bark plate offering shelter for individual bat (Plate 25).	Low

Bat Tree ID	Species	Age/DBH*	Safe to climb?	Features	Overall Tree Suitability
28	White poplar (*Populus alba*)	Semi mature /30cm	Yes	Split limb (Plate 26).	Low
29	White poplar (*Populus alba*)	Semi mature /30cm	Yes	Rot hole (Plate 27).	Low
30	White poplar (*Populus alba*)	Semi mature /40cm	Yes	Rot hole and canker weathering (Plate 28).	Low
31	White poplar (*Populus alba*)	Semi mature /40cm	No	Large basal cavity (Plate 29).	Moderate
32	White poplar (*Populus alba*)	Mature /50cm	No	2 moderate and 3 low potential roosting features (Plate 30) including; basal cavity (Plate 31), rot holes (Plate 32) and split limbs.	Moderate
33	White poplar (*Populus alba*)	Semi mature /40cm	Yes	Hazard beam and rot role (Plate 33).	Moderate
34	White poplar (*Populus alba*)	Mature /50cm	Yes	Woodpecker hole (Plate 34).	Low
35	Elder (*Sambucus nigra*)	Dead /20cm	No	Rot hole (Plate 35).	Low
36	Elder (*Sambucus nigra*)	Semi mature /40cm	Yes	2 pruning wounds (Plate 36).	Low
37	Unknown	Semi mature /40cm	Yes	Small gap between two limbs creates shelter for individual bats only (Plate 37).	Low

Bat Tree ID	Species	Age/DBH*	Safe to climb?	Features	Overall Tree Suitability
38	White poplar (*Populus alba*)	Mature /50cm	Yes	Rot hole c. 0.5 m in height (Plate 38).	Low
39	Aspen (*Populus tremula*)	Semi mature /40cm	Yes	1 medium feature (callus) and 4 low potential features (pruning wounds) (plate 39).	Moderate
40	Poplar (*Populus*) sp.	Immature /40cm	No	Bird box provides PRF(Plate 40).	Low
41	Poplar (*Populus*) sp.	Semi mature /60cm	Yes	Bird box provides PRF(Plate 41).	Low
*DBH = Diameter at breast height					

2.2 Emergence Survey Results

Building Group 1

3.3.1 No bats were recorded emerging from any of the buildings in Building Group 1 during either of the dusk emergence surveys.

3.3.2 The results of each emergence survey are provided in *Table 12*, Annex 2.

Building Group 2

3.3.3 No bats were recorded emerging from Building Group 2 during either of the dusk emergence surveys.

3.3.4 The results of the emergence surveys on Building Group 2 are presented in *Table 13*, Annex 2.

Building Group 3

3.3.5 No bats were recorded emerging from Building Group 3 during either of the dusk emergence surveys.

3.3.6 The results of the emergence surveys on Building Group 3 are presented in *Table 14*, Annex 2.

2.2 Transect Results

3.4.1 No bats were recorded re-entering any of the buildings on the Site during either of the dawn transect surveys and no swarming behavior was exhibited.

3.4.2 In general, very little bat activity was recorded during the transect surveys with only sporadic common pipistrelle, soprano pipistrelle (foraging) and Leisler's bat (commuting) recorded.

2.2 Static Monitoring Results

3.5.1 Across all of the monitoring points, at least nine species of bat were recorded. The results of each static detector deployment are presented in Annex 3, whilst a summary of results is presented in *Table 8* and *Table 9* below and presented visually in *Figure* 10.

3.5.2 The number of bat passes or registrations shown in the following tables equates to the number of files recorded by the detector, with a maximum file length of five seconds, attributed to a species or genus of bat. Bat activity is measured in the number of bat registrations; therefore, this value does not directly equate to the number of bats present.

Table 8. Total number of bat registrations per Static Location (all species combined) between April and October 2023.

Static Location	April	May	June	July	August	September	October	Total
1	2487	8280	23549	-	-	-	1224	**35540**
2	181	1697	520	332	810	695	23	**4258**
3	31	99	-	-	-	-	-	**130**
4	225	3458	3959	-	-	0	-	**7462**
5	470	3791	277	Equipment failure	-	50	-	**4588**
6	20	9240	495	-	574	-	Equipment failure	**10329**
7	**Location 7 only used during emergence surveys to supplement data.**							
8	-	-	1347	-	-	9	-	**1356**
9	**No data as location 9 could not be reached on the ground.**							
10	-	-	-	17	997	-	67	**1081**
11	-	-	-	57	Equipment failure	781	3117	**3955**
12	-	-	-	176	1031	-	158	**1365**
13	-	-	-	2283	Detector interference	-	-	**2283**
Total	**3414**	**26565**	**30147**	**2865**	**3412**	**1535**	**4589**	**72,527**

- Denotes that static detector was not deployed in this location for the month in question.

Table 9. Bat species registrations composition recorded across all statics with approx. percentage activity shown. Note that percentages between species / species groups cannot be used to determine relative abundance.

Species	April	May	June	July	August	September	October	Total	Species % of Total	Genus % of total
***Myotis* species**	1	61	26	15	76	8	83	270	**0.37**	**0.37**
Noctule	0	0	45	20	61	0	1	127	**0.18**	**1.05**
Leislers	0	28	590	7	5	0	1	631	**0.90**	
Serotine	0	5	1133	14	50	3	1	1205	**1.72**	**1.72**
Common pipistrelle	1695	17569	21816	2203	1467	570	1911	47231	**67.25**	**91.56**
Soprano Pipistrelle	1718	8732	6307	575	1210	244	230	19016	**27.08**	
Nathusius's pipistrelle	0	30	80	4	5	18	19	156	**0.22**	
Barbastelle	0	133	30	18	522	685	2317	3705	**5.28**	**5.28**
Long-eared bat species	0	7	121	9	16	7	26	186	**0.26**	**0.26**
Total passes	**3414**	**26565**	**30147**	**2865**	**3412**	**1535**	**4589**	**72,527**		

Bat activity levels

3.5.3 The results show that 72,527 bat registrations were recorded across all of the automated surveys.

3.5.4 As shown in *Table 8*, May and June recorded the highest levels of bat activity, with there being five to six times as much activity recorded (respectively) compared to the next highest activity month, which was recorded in October. Common and soprano pipistrelles constituted 99.1% of all bat activity recorded in May and 93.3% of all bat activity recorded in June. Given the lack of emergences, these peaks are likely to have resulted from commuting and foraging activity concentrated in a few locations.

3.5.5 The results show a significant difference between the number of recordings collected in different locations across the Site (*Table 8*). The highest levels of bat activity were recorded at Location 1, located at the northern edge of the built area on a linear feature, with 35,540 total bat registrations recorded. This constitutes just over half (53%) of all bat registrations recorded across all static monitoring locations and is over three times the number of passes at the next highest location (10,329 (14%) registrations at Location 6, at the southern edge of the built area on a linear feature).

Species diversity

3.5.6 At least nine species of bat were recorded during the static detector surveys comprising; *Myotis* species, noctule, Leisler's, serotine, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, barbastelle and long-eared bat species (*Table 9*). The highest diversity at a single Static Location was nine species and this was recorded at Locations 1, 2 and 12. Location 2 is to the west of Location 1 and broadly linked to it; Location 12 is on the western edge of the Site, separated from the main development footprint.

3.5.7 Pipistrelle dominated the recordings with 91.56% of all registrations attributed to a species in this genus.

3.5.8 Common pipistrelle dominated the recordings overall (67.25%) and across all static locations. This was followed by soprano pipistrelle (27.08%), barbastelle (5.28%) and serotine (1.72%).

3.5.9 Percentage contributions of bat registrations cannot be directly translated to percentages of species; detectability needs to be taken into account, as well as the fact that detectors were not installed in every location in every month. However, the fact that the rare barbastelle is the third most commonly recorded species overall is unusual and worthy of note. This species was recorded at Static Locations 1, 2, 8, 10, 11, 12 and 13. Also of note is that barbastelle was the most commonly recorded species in October at Locations 11 and 12, i.e. more commonly recorded than either common or soprano pipistrelle. These locations were not monitored in all months of the year (see Table 10), but they were both monitored in June/July (during the breeding season), and very few registrations were recorded.

3.5.10 The remaining species each represent less than 1% of activity recorded across the Site, but this included one widely distributed, but rare species (Russ, 2017), the Nathusius' pipistrelle, which was recorded in Static Locations; 1, 2, 3, 4, 5, 6, 8, 10, 11,12. The most bat registrations of this species was recorded at Static Location 8 in June (51 registrations).

Table 10. Barbastelle registrations by location and month. Note that species registrations cannot be used to determine relative abundance.

Static Location	April	May	June	July	August	September	October	Total
1	0	2	3	-	-	-	107	**112**
2	0	131	12	9	112	364	0	**628**
8	-	-	15	-	-	0	-	**15**
10	-	-	-	-	5	-	2	**7**
11	-	-	-	0	-	321	2058	**2379**
12	-	-	-	2	405	-	150	**557**
13	-	-	-	7	-	-	-	**7**
Total	**0**	**133**	**30**	**18**	**522**	**685**	**2317**	**3705**

- Denotes that static detector was not deployed in this location for the month in question.

Spatial use of the Site

Table 11. Total number of bat registrations at each Static Location excluding common and soprano pipistrelle (as the two most common and widespread species).

Static Location	Total bat registrations	Common and soprano pipistrelle registrations	Bat registrations excluding common and soprano pipistrelle
1	35540	33602	**1938**
2	4258	3383	**875**
3	130	126	**4**
4	7642	7611	**31**
5	4588	4567	**21**
6	10329	10263	**66**
8	1356	1255	**101**
10	1064	1018	**63**
11	3955	1451	**2504**
12	1365	726	**639**
13	2278	1975	**303**
Total	**72527**	**65977**	**6650**

3.5.11 *Table 11* shows that the central area where, the holiday park buildings are located, is primarily used by common species of bats (Statics 4, 5, 6 and 10), whereas the western area of the site has a higher proportion of less common bats (Statics 1, 2, 8,11, 12 and 13).

3.5.12 Common and soprano pipistrelle were recorded at every location monitored and were the first and second highest number of registrations at all locations with the exception of Locations 11 and 12. This shows that common and soprano pipistrelle forage across the entire Site, albeit in likely low numbers. The most common species recorded at Locations 11 and 12 are barbastelle, accounting for 60.15% of all registrations at Location 11 and 40.81% of all registrations at Location 12. Both were located towards the western section of the Site in areas of dense scrub.

3.5.13 Serotine was the third most recorded species at Static Location 1, located at the northern edge of the built area on a linear feature, accounting for 3.2% of registrations.

3.5.14 Barbastelle were the third most recorded species at Static Location 2, located on the western boundary adjacent to a small woodland patch, accounting for 14.7% of registrations.

3.5.15 Nathusius's pipistrelle were the third most recorded species at Static Location 8, located on the western boundary adjacent to a hedgerow running parallel with the site access road, accounting for 3.76% of registrations.

3.5.16 The third most recorded species accounted for less than 2% of all recognitions at all other static locations (3,4,5,6,7,9,10 and 12).

4.0 EVALUATION AND RECOMENDATIONS

4.1 Roosting bats

Buildings

4.1.1 No emergences were recorded during any of the survey visits, and no re-entries or swarming activity was recorded during the (summer) dawn transects. Additionally, no evidence of bats was recorded during the PRA undertaken by RPS in May 2023, although it should be noted that no internal inspections were undertaken. The buildings in Phase 1 of the development are deemed unlikely to have hibernation potential due to their construction.

4.1.2 There is therefore no evidence to date of any roosts within Phase 1 of the development (see *Figure 3*). However, as there are 8 high, 10 moderate and 2 low suitability buildings within Phase 1, the presence of small numbers of bats, likely low conservation status roosts of common species, cannot be ruled out.

4.1.3 The majority of the buildings on the Site are due to be demolished as part of the proposed development. Further survey work will be required to establish if buildings in development phases 2 and 3 support roosting bats; this is outlined in the environmental statement (663871 Medmerry ES RSK V1 - Chapter 6).

Trees

4.1.4 Forty-one of the trees on the Site have features suitable for roosting bats; however, most of the trees are to be retained as part of the development proposals.

4.1.5 Trees 12-17, 27 and 37- 41 are due to be removed to facilitate the development. Further survey work will be required to establish if these trees support roosting bats; this is outlined in the environmental statement report (663871 Medmerry ES RSK V1 - Chapter 6).

4.2 Foraging and commuting bats

Bat diversity and levels of activity

4.2.1 In total, static surveys recorded 72,527 bat registrations with a minimum of nine species recorded across all surveys. It is possible that some of the calls that were identified to the genera *Myotis and Plecotus* resulted from additional species but, given the low number of such calls and the habitats present, this is considered unlikely. According to the UK Bat Mitigation Guidelines (Reason & Wray, 2023), this could meet the threshold for an assemblage of County importance; however, the very low numbers of some species, and the dearth of activity across much of the area surveyed, this would perhaps be over-precautionary.

4.2.2 Based on the levels of activity recorded and the species assemblage present, much of the area surveyed appears to be of limited importance to bats, with the exceptions being the hedgerows, ditches and scrub. However, the locations of these habitats are limited to the western section of the site particularly the commuting route on the way to the beach which forms a network of ecologically linked habitats. Static 1 recorded the highest levels of bat

activity, likely attributable to higher quality habitat supporting a higher abundance and diversity of invertebrates.

4.2.3 Bat activity levels varied across the statics and months. Bat activity can vary year on year and monthly variations can also be attributed to changing weather conditions, insect prey availability and temperatures. It is also important to reiterate that not all locations were surveyed in all months, and that not all bats are equally detectable.

4.2.4 Although all species of bats are legally protected, barbastelle is afforded additional protection as an Annex II bat species (under the Habitats Directive) for which Special Areas of Conservation (SACs) may be designated. It is one of our rarer species, though probably under-recorded.

4.2.5 Barbastelle was the third most commonly recorded species overall; however, it would seem unlikely that breeding colonies are present within a few km of the site. Barbastelle maternity colonies generally form in May and births occur from Mid-June to July (Vincent Wildlife Trust, 2023). First recorded in May, registrations in October at Locations 11 and 12 were more common than those of common and soprano pipistrelle (which elsewhere dominated the data set). These locations were not monitored in all months of the year (see *Table 10*), but they were both monitored in June/July (during the breeding season), and very few barbastelle registrations were recorded. It is possible, that maternity colonies are present at a distance from this location, and that females do not travel as far whilst suckling their young. Maternity roost colonies disperse in August, therefore, the increase from August - October could be attributed to adult bats with juveniles foraging more widely.

4.2.6 This hypothesis is supported by the fact that barbastelles are a woodland specialist and no suitable roosting habitats for this species appear to be present within several km of the Site. In fact, a review of aerial imagery and ordnance survey mapping indicated that the closest suitable woodland which could provide barbastelle roosting opportunities may be over 10 km away. The timing of registrations also supports this hypothesis; barbastelle were generally recorded between 23:00 and 03:00, matching the expected pattern for a foraging site some distance away from the woodland(s) used for breeding[2]. .

4.2.7 The data further indicates a commuting line following the locations of Statics 8, 2, 12 and 11 down to the beach which may be being used as a foraging resource (shown in *Figure 10*. Barbastelle studied in Norfolk are known to make use of coastal habitats (Harris, 2020[3]). Barbastelle registrations at Static Location 1 and 13 may represent opportunistic feeding adjacent to the commuting route at a point at which the habitat is better suited to supporting a higher diversity of invertebrate prey.

4.2.8 Common and soprano pipistrelle calls dominated the recordings; this is not only because they are abundant and widespread, but also because they are some of the easiest calls to register and identify. Pipistrelle maternity colonies generally form in May and births occur from Mid-June to July (Dietz & Kiefer, 2014). Activity levels on Site peaked in May and early June i.e the pre and early-maternity season. As no evidence of roosting has been

[2] Breeding barbastelle are known from studies for the A27 Arundel Bypass (available online); about 20km away and within known flight distances for barbastelle

[3] A review of the barbastelle *Barbastella barbastellus* in Norfolk based on the work of the Norfolk Barbastelle Study Group. British island bats, 1: 33-49. Available at: https://cdn.bats.org.uk/uploads/pdf/Resources/Bat-Groups/Accessing-journals/BritishIslandsBats_VolOne_2020.pdf?v=1593463181

recorded during emergence/return and dawn swarming surveys, it is likely that these breeding roosts are located off-site, with the Site itself used as a foraging resource.

4.2.9 A review of aerial imagery and ordnance survey mapping indicated the presence of suitable structures for a maternity roost in the adjacent farm, Bracklesham Bay and Earnley areas.

4.2.10 Significantly fewer bat registrations were recorded for the other species, all of which contributed less than 1% of the total recorded bat registrations, suggesting they do not use the Site on a regular basis.

4.2.11 Bat activity generally decreases in September and October as air temperature starts to decrease and insect prey becomes less available. This was reflected in the static results for September. However, October saw an increase in bat activity, and this could be attributed to foraging barbastelles.

Habitats and areas of activity (spatial use of the Site)

4.2.12 Spatially, the highest levels of bat activity were recorded along natural linear features such as hedgerows, ditches and waterways. It should be noted that there is an inherent (but acceptable) bias with static detector deployment, as they primarily focus on surveying such features (rather than exposed, open areas) since they are typically most used by commuting and foraging bats. However, more open exposed areas around the central section of the Site and open areas between linear features were also sampled (Static Locations 4 and 5).

4.2.13 Excluding common and soprano pipistrelles (which are the most abundant and widespread species and were recorded at every static location), the highest level of bat activity from the static surveys was recorded at Location 11 followed by Locations 1, 2, 12, 13 and 8. All other locations had fewer than 100 bat registrations throughout the monitoring period when common and soprano pipistrelles are excluded.

4.2.14 As shown in *Figure 10*, Static Locations 2, 8, 11 and 12 are ecologically connected to form a linear commuting route along hedgerows, woodland edge and scrub. Therefore, it is a reasonable assumption that these areas are of most value to bats using the Site and form an important commuting corridor for barbastelles.

5.0 CONCLUSIONS

5.1.1 The survey results presented in this report to inform the Medmerry Holiday park re-development recorded a total of 72,527 bat registrations with a minimum of nine species recorded across all surveys.

5.1.2 In the surveys undertaken to date, there has been no evidence that bats are using the habitats within Phase 1 of the proposed development for breeding or roosting. However, as there are 8 high, 10 moderate and low suitability buildings within Phase 1 and 41 trees with PRFs within the Site, the presence of small numbers of bats, likely low conservation status roots of common species, cannot be ruled out.

5.1.3 Common and soprano pipistrelle were recorded at every location on the Site and were the first and second highest number of registrations at all locations with the exception of Locations 11 and 12.

5.1.4 The most common species recorded at Locations 11 and 12 is barbastelle which accounted for 60% of all registrations at Location 11 and 41% of all registrations at Location 12. Locations 11 and 12 were both located towards the western section of the Site in areas of dense scrub. These formed part of a barbastelle commuting route, potentially of **county level importance**, along the western boundary of the Site.

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FIGURES

480400 480600 480800 481000 481200 481400 481600 481800 482000 482200 482400 482600 482800 483000 483200 483400

97000 96800 96600 96400 96200 96000 95800 95600 95400 95200 95000 94800 94600 94400

Earnley
Bracklesham Bay
Clappers Lane
B2198
B2198
Farm Road
Bracklesham
East Bracklesham Drive
Earnley Rife
Drove Lane
Grange Rife
Grange Rife
Easton Rife
Broad Rife
Broad Rife
Broad Rife

Legend:

Site Boundary

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	2485083	TG	SP	CW

Medmerry Holiday Park

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 1:

Site Location Plan

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Metres
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N W E S

REV 00

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96100 96000 95900 95800 95700 95600 95500 95400

Legend:

- Site Boundary

Development Phase Boundary

- 2023
- 2024
- 2025

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	2485083	TG	SP	CW

Medmerry Holiday Park

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 2:

Development Phases

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3

1

2

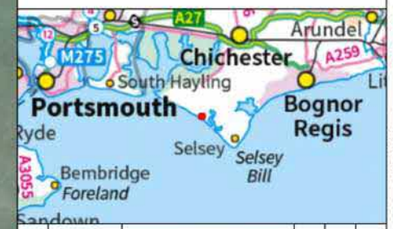
Legend:

Site Boundary

Development Phase Boundary

2023

2023 Building Groups



Rev	Date	Description	Drn	Chk	App
00	24/10/2023	2485083	TG	SP	CW

Medmerry Holiday Park

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 3:

Building Groups within 2023 Boundary

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SCALE: 1:1,250 @ A3

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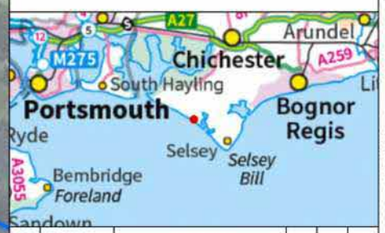
95780 95760 95740 95720 95700 95680 95660 95640 95620 95600 95580

Legend:

- Site Boundary
- Development Phase Boundary
- 2023
- 2023 Building Groups
- Surveyor Location



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Medmerry Holiday Park

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 4:

Surveyor Locations
Building Group 1 2023 Boundary

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Metres
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95780 95760 95740 95720 95700 95680 95660 95640 95620 95600

4 9 6 2 5 7 3 8 1

Legend:
- Site Boundary
- Development Phase Boundary
- 2023
- 2023 Building Groups
- Surveyor Location

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	2485083	TG	SP	CW

Medmerry Holiday Park

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 5:

Surveyor Locations
Building Group 2 2023 Boundary

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N W E S

REV 00

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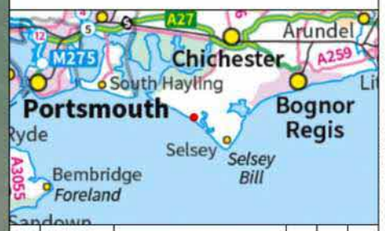
95900 95880 95860 95840 95820 95800 95780 95760 95740 95720 95700

1 2 3 4 5 6 7 8 9

Legend:
- Site Boundary
- Development Phase Boundary
- 2023
- 2023 Building Groups
- Surveyor Location



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Medmerry Holiday Park

RSK biocensus EXPERTS IN ECOLOGY

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Surveyor Locations
Building Group 3 2023 Boundary

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N W E S

REV 00

Document Path: C:\OneDrive\RSK Group\RSK Biocensus - 06 GIS - 2485083 - PEA EIA Medmerry Holiday Park Earnley\03 - APRX\CW Figures\2485083 - Medmerry Holiday Park - Figure 6 - Building Group 3 Surveyor Locations.aprx

481850 481900 481950 482000 482050 482100 482150 482200

95900 95850 95800 95750 95700 95650 95600

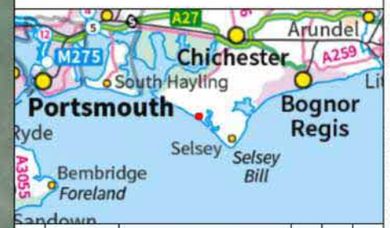
Legend:

Site Boundary

Development Phase Boundary

2023

Transect Route



Rev	Date	Description	Drn	Chk	App
00	24/10/2023	2485083	TG	SP	CW

Medmerry Holiday Park

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 7:

Transect Route
2023 Boundary

0 10 20 30
Metres

SCALE: 1:1,250 @ A3

N W E S

REV 00

Document Path: C:\OneDrive\RSK Group\RSK Biocensus - 06 GIS - 2485083 - PEA EIA Medmerry Holiday Park Earnley\03 - APRX\CW Figures\2485083 - Medmerry Holiday Park - Figure 7 - Transect Route 2023.aprx

481500 481600 481700 481800 481900 482000 482100 482200 482300 482400

96100 96000 95900 95800 95700 95600 95500 95400

8 13 1 2 9 12 7 10 4 5 11 3 6

Legend:

Site Boundary

Static Detector Location

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	2485083	TG	SP	CW

Medmerry Holiday Park

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 8:

Static Detector Locations

0 30 60 90
Metres
SCALE: 1:3,000 @ A3

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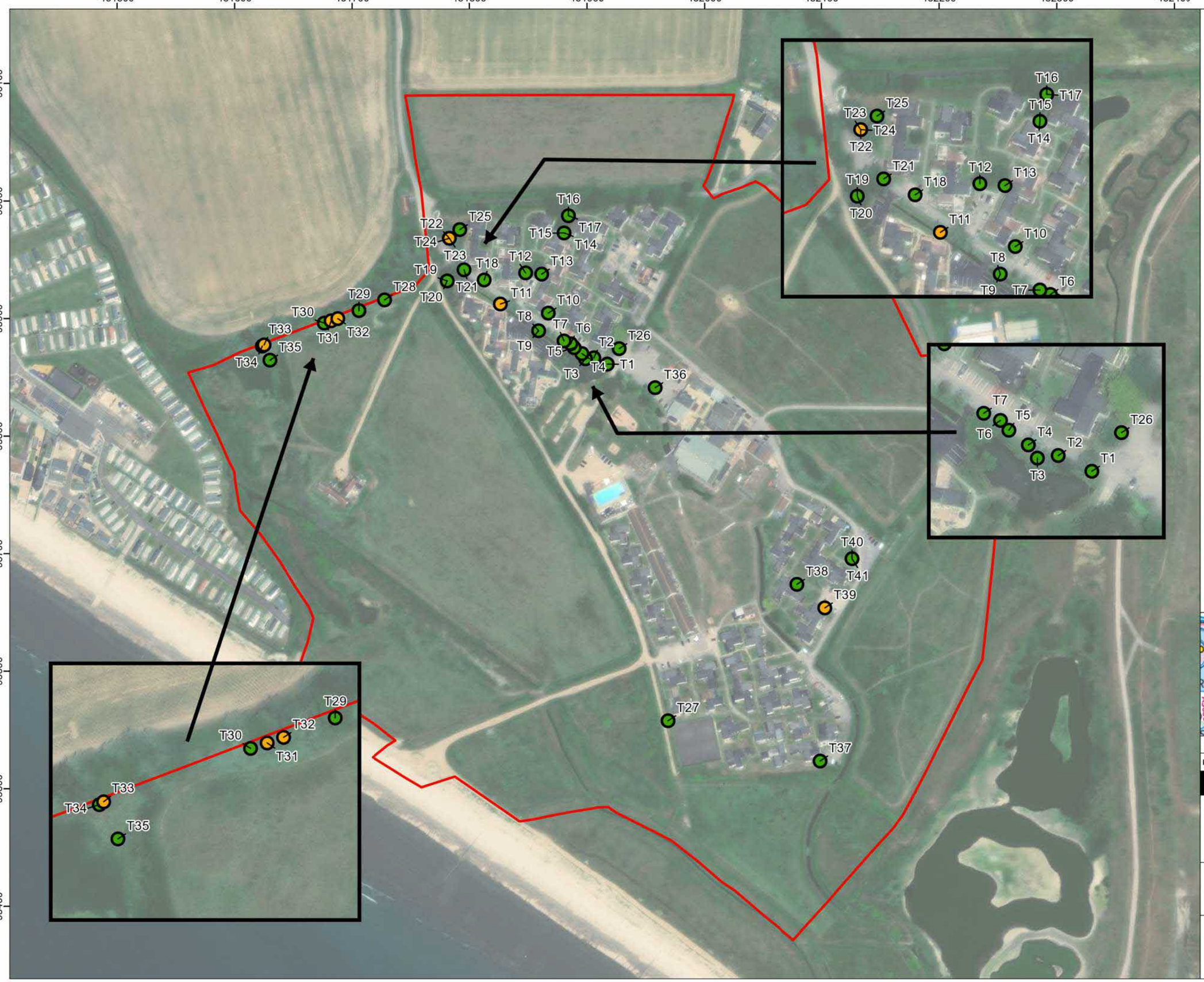
Document Path: C:\OneDrive\RSK Group\RSK Biocensus - 06 GIS - 2485083 - PEA EIA Medmerry Holiday Park Earnley\03 - APRX\CW Figures\2485083 - Medmerry Holiday Park - Figure 8 - Static Detector Locations.aprx

481500 481600 481700 481800 481900 482000 482100 482200 482300 482400

96100 96000 95900 95800 95700 95600 95500 95400



Legend:

- Site Boundary

Bat Tree Suitability

- Moderate
- Low

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	2485083	TG	SP	CW

Medmerry Holiday Park

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 9:

GLTA Results

0 30 60 90

Metres

SCALE: 1:3,000 @ A3

N W E S

REV 00

Document Path: C:\OneDrive\RSK Group\RSK Biocensus - 06 GIS - 2485083 - PEA EIA Medmerry Holiday Park Earnley\03 - APRX\CW Figures\2485083 -

481500 481600 481700 481800 481900 482000 482100 482200 482300 482400

96100 96000 95900 95800 95700 95600 95500 95400

Legend:

- Site Boundary
- Static Detector Location
- Barbastelle Commuting Route

Bat Species Recorded

- Barbastelle
- Serotine
- Long-eared bat species
- Myotis bat species
- Nyctalus bat species
- Nathusius' pipistrelle
- Soprano pipistrelle
- Common pipistrelle

Rev	Date	Description	Drn	Chk	App
00	02/11/2023	2485083	TG	SP	CW

Medmerry Holiday Park

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 10:

Summary of Static Detector Results

0 30 60 90

Metres

SCALE: 1:3,000 @ A3

REV 00

Document Path: C:\OneDrive\RSK Group\RSK Biocensus - 06 GIS - 2485083 - PEA EIA Medmerry Holiday Park Earnley\03 - APRX\CW Figures\2485083 - Medmerry Holiday Park - Figure 10 - Summary of Static Detector Results.aprx

ANNEX 1 3 GLTA RESULTS

Plate 1: White poplar with basal cavity

Plate 2: White poplar with basal cavity

Plate 3: White poplar with cavity in main stem.

Plate 4: Apple tree with small cavity

Plate 5: White poplar with 2 small splits.

Plate 6: White poplar with bird box.

Plate 7: White poplar with pruning wounds

Plate 8: White poplar with bird box and wound.

Plate 9: White poplar with hole leading into the main stem

Plate 10: White poplar with pruning wound and basal cavity.

Plate 11: White poplar with one moderate and one low potential PRF.

Plate 12: Grey willow with two splits.

	
Plate 13: White willow with split in the main stem	Plate 14: Poplar with potential cavity on 6m high limb.
	
Plate 15: Poplar with callus roll c. 12m in height.	Plate 16: White poplar with bird box and cavity from lost limb.
	
Plate 17: Poplar with pruning wound and small cavity between two stems.	Plate 18: White poplar with bird box

Plate 19: White poplar with two woodpecker holes and one butt crevice.

Plate 20: White poplar with bird boxes.

Plate 21: Callus in white poplar.

Plate 22: White poplar with hazard beam and bird box.

Plate 23: White poplar with 3 PRFs including rot hole c. 0.5 m in height.

Plate 24: Split in the upper crown.

	
Plate 25: Bark plate offering potential shelter for individual bat.	Plate 26: White poplar with split limb.
	
Plate 27: White poplar with rot hole.	Plate 28: White poplar with rot hole and canker.
	
Plate 29: White poplar with large basal cavity.	Plate 30: White poplar with 5 potential roosting features.

Plate 31: White poplar with basal cavity.

Plate 32: White poplar with rot hole.

Plate 33: White poplar with hazard beam and rot hole.

Plate 34: Woodpecker hole in white poplar.

Plate 35: Rot hole in dying elder.

Plate 36. Elder with pruning wounds.

Plate 37: Gap created by two limbs may create a space large enough to support individual numbers of bats only.

Plate 38: White poplar with rot hole.

Plate 39: Aspen with pruning wounds and callas.

Plate 40: Poplar with bird box providing a PRF.

Plate 41: Poplar with bird box providing a PRF.

ANNEX 2 3 FULL EMERGENCE SURVEY RESULTS

Building Group 1

Table 12. Building Group 1 Emergence Survey Results

Survey Date	Surveyors and surveyor locations	Results
06/06/2023	Daniel Fellman (lead; Survey Position 3) with assistance from Ellis Perry (Survey Position 4), Joe Pepper (Survey Position 1) and Alan Yap (Survey Position 2).	The first bat recorded was a soprano pipistrelle at 21:51. This was picked up by the static detector at Survey Position 5. No further bats were picked up in Survey Position 5 for the remainder of the survey. Soprano pipistrelle was also heard but not seen at 22:13 and 22:25 at Survey Position 4. Soprano pipistrelle passes were also picked up on static detector 7 at 22:11; 22:13; 21:14; 22:25; 22:29 and 22:46. Common pipistrelle was heard at 22:18 at Survey Position 3. This was attributed to a single bat foraging on the track alongside the swimming pool area. No bats were heard at locations 1 and 2 throughout the survey. **No emergences were detected by the surveyors or IR cameras**. The detector record picked up on the static detector within the survey area could have been a bat approaching the detector without being seen or recorded on the surveyors9detectors due to the distance between surveyors and the brief encounter of the bat activity.
11/07/2023	Daniel Fellman (lead; Survey Position 6) with assistance from Ellis Perry (Survey Position 8), Joe Pepper (Survey Position 9) and Alan Yap (Survey Position 7).	Surveyors positioned in survey locations 6-9 with the aim of confirming that the soprano pipistrelle recorded during survey 1 in June was likely to have commuted onto the Site as opposed to emerging from one of the buildings nearby. No bats were heard at any survey or Static Location during the survey.

Survey Date	Surveyors and surveyor locations	Results
		It can therefore be concluded that **there were no emergences from any of the buildings.**

Building Group 2

Table 13. Building Group 2 Emergence Survey Results

Survey Date	Surveyors and surveyor locations	Results
07/06/2023	Daniel Fellman (lead; Survey Position 2) with assistance from Ellis Perry (Survey Position 1), Joe Pepper (Survey Position 4) and Alan Yap (Survey Position 3).	The first bat heard was a single soprano pipistrelle recorded at 22:08 from survey location 5. A soprano pipistrelle was also recorded by static detector location 7 at 22:09. A single common pipistrelle was recorded at 22:18 at Survey Position 4. This bat did not emerge from any of the buildings being surveyed. A common pipistrelle was also recorded by static detector location 7 at 22:38. No bats were heard at positions 1,2 and 3 throughout the survey. It is possible that the soprano pipistrelle recorded at survey location 5 could have commuted onto the Site from the west and past the buildings without being picked up by detectors at survey locations 1 and 2. It is possible that the single soprano pipistrelle pass recorded by static detector 7 at 22:09 was the same bat as that recorded from survey location 5 one minute earlier. It can therefore be inferred that this bat was exhibiting commuting behaviour and it is likely to have commuted onto the Site from the west and not emerged from any of the buildings on Site. Given these assumptions**, it is unlikely that there were any emergences.**

Survey Date	Surveyors and surveyor locations	Results
12/07/2023	Daniel Fellman (lead; Survey Position 6) with assistance from Ellis Perry (Survey Position 8), Joe Pepper (Survey Position 5) and Alan Yap (Survey Position 7).	A single soprano pipistrelle was recorded at 22:07 at location 8. This bat did not emerge from any of the buildings being surveyed. No other bats were recorded from any other position throughout the survey. **There were no emergences from any of the buildings.**

Building Group 3

Table 14. Building Group 3 Emergence Survey Results

Survey Date	Surveyors and surveyor locations	Results
08/06/2023	Daniel Fellman (lead; Survey Position 3) with assistance from Ellis Perry (Survey Position 2), Joe Pepper (Survey Position 4) and Alan Yap (Survey Position 1).	A single common pipistrelle was recorded at Survey Position 1 at 22:13. A single soprano pipistrelle was recorded at Survey Position 2 at 22:21. A foraging common pipistrelle was recorded at 22:13, 22:19, 22:21, 22: 22, 22:37,22:38, 22:99 and 22:45, at Survey Position 3. No bats were recorded from Survey Positions 4 and 5. A soprano pipistrelle was recorded at 22:22 at Static Location static 7. **No bats were recorded emerging from the buildings.**
13/07/2023	Daniel Fellman (lead; Survey Position 7) with assistance from Ellis Perry (Survey Position 9), Joe Pepper (Survey Position 6) and Alan Yap (Survey Position 8).	A single *Myotis* species was recorded at 22:28 at Survey Position 7. Two *Myotis* species passes were recorded at 22:28 from Survey Position 6. No other bats were recorded during the survey. **No bats were recorded emerging from the buildings.**

ANNEX 3 3 FULL STATIC MONITORING RESULTS TABLES

Location 1

Table 15. Location 1 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	0	31	8	-	-	-	12	51	0.14	0.14
Noctule	0	0	29	-	-	-	1	30	0.08	1.67
Leisler's bat	0	0	564	-	-	-	1	565	1.6	
Serotine	0	0	1126	-	-	-	0	1126	3.2	3.2
Common pipistrelle	1209	7325	16519	-	-	-	929	25982	73.1	94.60
Soprano pipistrelle	1278	922	5250	-	-	-	170	7620	21.4	
Nathusius's pipistrelle	0	0	16	-	-	-	0	16	0.05	
Barbastelle	0	2	3	-	-	-	107	112	0.3	0.3
Long-eared bat species	0	0	34	-	-	-	4	38	0.1	0.1
Total	2487	8280	23549	-	-	-	1224	35540		
- Denotes that static detector was not deployed in this location for the month in question										-

Location 2

Table 16. Location 2 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	0	27	11	8	36	3	0	85	2.0	2.0
Noctule	0	0	1	7	14	0	0	22	0.5	0.56
Leislers	0	0	0	2	0	0	0	2	0.05	
Serotine	0	3	0	13	8	1	0	25	0.6	0.6
Common pipistrelle	96	1013	326	214	426	211	14	2300	54.0	80.1
Soprano Pipistrelle	85	506	86	77	208	112	9	1083	25.4	
Nathusius9s pipistrelle	0	16	3	1	2	4	0	26	0.6	
Barbastelle	0	131	12	9	112	364	0	628	14.7	14.7
Long-eared bat species	0	1	81	1	4	0	0	87	2.0	2.0
Total	181	1697	520	332	810	695	23	4258		

Location 3

Table 17. Location 3 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	1	0	-	-	-	-	-	1	0.77	0.77
Noctule	0	0	-	-	-	-	-	0	0.00	0.00
Leislers	0	0	-	-	-	-	-	0	0.00	
Serotine	0	0	-	-	-	-	-	0	0.00	0.00
Common pipistrelle	14	43	-	-	-	-	-	57	43.85	97.70
Soprano Pipistrelle	16	53	-	-	-	-	-	69	53.08	
Nathusius9s pipistrelle	0	1	-	-	-	-	-	1	0.77	
Long-eared bat species	0	2	-	-	-	-	-	2	1.54	1.54
Barbastelle	0	0	-	-	-	-	-	0	0.00	0.00
Total	31	99	-	-	-	-	-	130		
- Denotes that static detector was not deployed in this location for the month in question										

Location 4

Table 18. Location 4 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	0	0	1	-	-	-	-	1	0.01	0.01
Noctule	0	0	0	-	-	-	-	0	0.00	0.22
Leislers	0	0	17	-	-	-	-	17	0.22	
Serotine	0	0	0	-	-	-	-	0	0.00	0.00
Common pipistrelle	91	2287	3280	-	-	-	-	5658	74.04	99.71
Soprano Pipistrelle	134	1167	652	-	-	-	-	1953	25.56	
Nathusius9s pipistrelle	0	0	9	-	-	-	-	9	0.12	
Barbastelle	0	0	0	-	-	-	-	0	0.00	0.0
Long-eared bat species	0	4	0	-	-	-	-	4	0.05	0.05
Total	225	3458	3959	-	-	-	-	7642		
- Denotes that static detector was not deployed in this location for the month in question										

Location 5

Table 19. Location 5 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	0	0	0	-	-	0	-	0	0.0	0.0
Noctule	0	0	7	-	-	0	-	7	0.2	0.2
Leislers	0	0	0	-	-	0	-	0	0.0	
Serotine	0	1	0	-	-	0	-	1	0.0	0.0
Common pipistrelle	280	2562	195	-	-	9	-	3046	66.4	99.8
Soprano Pipistrelle	190	1218	74	-	-	39	-	1521	33.2	
Nathusius9s pipistrelle	0	10	1	-	-	2	-	13	0.3	
Barbastelle	0	0	0	-	-	0	-	0	0.0	0.0
Long-eared bat species	0	0	0	-	-	0	-	0	0.0	0.0
Total	470	3791	277	-	-	50	-	4588		
- Denotes that static detector was not deployed in this location for the month in question										

Location 6

Table 20. Location 6 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	0	3	0	-	5	-	-	8	0.08	0.08
Noctule	0	0	0	-	26	-	-	26	0.25	0.52
Leislers	0	28	0	-	0	-	-	28	0.27	
Serotine	0	1	0	-	0	-	-	1	0.01	0.01
Common pipistrelle	5	4339	322	-	238	-	-	4904	47.48	99.39
Soprano Pipistrelle	15	4866	173	-	305	-	-	5359	51.88	
Nathusius9s pipistrelle	0	3	0	-	0	-	-	3	0.03	
Barbastelle	0	0	0	-	0	-	-	0	0.00	0.00
Long-eared bat species	0	0	0	-	0	-	-	0	0.00	0.00
Total	20	9240	495	-	574	-	-	10329		
- Denotes that static detector was not deployed in this location for the month in question										

Location 8

Table 21. Location 8 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	-	-	6	-	-	0	-	6	0.44	0.44
Noctule	-	-	8	-	-	0	-	8	0.59	1.18
Leislers	-	-	8	-	-	0	-	8	0.59	
Serotine	-	-	7	-	-	0	-	7	0.52	0.52
Common pipistrelle	-	-	1174	-	-	6	-	1180	87.02	96.31
Soprano Pipistrelle	-	-	72	-	-	3	-	75	5.53	
Nathusius9s pipistrelle	-	-	51	-	-	0	-	51	3.76	
Barbastelle	-	-	15	-	-	0	-	15	1.11	1.11
Long-eared bat species	-	-	6	-	-	0	-	6	0.44	0.44
Total	-	-	1347	-	-	9	-	1356		
- Denotes that static detector was not deployed in this location for the month in question										

Location 10

Table 22. Location 10 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	-	-	-	0	8	-	9	17	1.57	1.57
Noctule	-	-	-	0	7	-	0	7	0.66	0.66
Leislers	-	-	-	0	0	-	0	0	0.00	
Serotine	-	-	-	0	16	-	0	16	1.50	1.50
Common pipistrelle	-	-	-	11	463	-	34	508	47.74	94.54
Soprano Pipistrelle	-	-	-	6	487	-	17	510	47.93	
Nathusius9s pipistrelle	-	-	-	0	2	-	2	4	0.38	
Barbastelle	-	-	-	0	5	-	2	7	0.66	0.66
Long-eared bat species	-	-	-	0	9	-	3	12	1.13	1.13
Total	-	-	-	17	997	-	67	1081		
- Denotes that static detector was not deployed in this location for the month in question										

Location 11

Table 23. Location 11 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	-	-	-	0	-	5	62	67	1.69	1.69
Noctule	-	-	-	0	-	0	0	0	0.00	0.00
Leislers	-	-	-	0	-	0	0	0	0.00	
Serotine	-	-	-	0	-	2	1	3	0.08	0.08
Common pipistrelle	-	-	-	43	-	344	930	1317	33.30	37.42
Soprano Pipistrelle	-	-	-	14	-	90	30	134	3.39	
Nathusius9s pipistrelle	-	-	-	0	-	12	17	29	0.73	
Barbastelle	-	-	-	0	-	321	2058	2379	60.15	60.15
Long-eared bat species	-	-	-	0	-	7	19	26	0.66	0.66
Total	-	-	-	57	-	781	3117	3955		
- Denotes that static detector was not deployed in this location for the month in question										

Location 12

Table 24. Location 12 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	-	-	-	2	27	-	0	29	2.12	2.12
Noctule	-	-	-	0	14	-	0	14	1.03	1.53
Leislers	-	-	-	2	5	-	0	7	0.51	
Serotine	-	-	-	0	26	-	0	26	1.90	1.90
Common pipistrelle	-	-	-	81	340	-	4	425	31.14	53.26
Soprano Pipistrelle	-	-	-	87	210	-	4	301	22.05	
Nathusius9s pipistrelle	-	-	-	0	1	-	0	1	0.07	
Barbastelle	-	-	-	2	405	-	150	557	40.81	40.81
Long-eared bat species	-	-	-	2	3	-	0	5	0.37	0.37
Total	-	-	-	176	1031	-	158	1365		
- Denotes that static detector was not deployed in this location for the month in question										

Location 13

Table 25. Location 13 Full Static Monitoring Results

Species	April	May	June	July	August	September	October	Total	Species % of total	Genus % of total
Myotis species	-	-	-	5	-	-	-	5	0.22	0.22
Noctule	-	-	-	13	-	-	-	13	0.57	0.70
Leislers	-	-	-	3	-	-	-	3	0.13	
Serotine	-	-	-	1	-	-	-	1	0.04	0.04
Common pipistrelle	-	-	-	1854	-	-	-	1854	81.21	98.45
Soprano Pipistrelle	-	-	-	391	-	-	-	391	17.13	
Nathusius9s pipistrelle	-	-	-	3	-	-	-	3	0.13	
Barbastelle	-	-	-	7	-	-	-	7	0.31	0.31
Long-eared bat species	-	-	-	6	-	-	-	6	0.26	0.26
Total	-	-	-	2283	-	-	-	2283		
- Denotes that static detector was not deployed in this location for the month in question										

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