Bat Activity Survey 2025

Land at west of Shoreham Road, Small Dole, West Sussex

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LIABILITIES:

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living creatures are capable of migration and whilst protected species may not have been located during the survey duration, their presence may be found on a site at a later date.

The views and opinions contained within this document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to or during works.

1.0 Introduction

Background

1.1 The Ecology Partnership were commissioned by Wates Development Ltd to undertake monthly bat activity surveys on land west of Shoreham Road, Small Dole, West Sussex BN5 9YH. The red line boundary of the site is shown in Figure 1.

Figure 1: Approximate boundary of the site and immediate surroundings.

1.2 An initial preliminary ecological appraisal (PEA) was undertaken by The Ecology Partnership in March 2022, with subsequent surveys in 2022 (The Ecology Partnership 2022). An updated PEA was conducted in September 2024 (The Ecology Partnership 2024). These reports identified moderate habitat suitability for foraging and commuting bats. This habitat was largely restricted to the site boundaries, which had connectivity both on site and within the wider landscape.

1.3 The ecological surveys have been updated in 2025 due to the time lapse between the initial surveys in 2022.

1.4 This report presents the results of The Ecology Partnership's surveys in and around the site, which aims specifically to assess how bats are using the site over the course of the 2025 survey season. This report identifies if there are any changes in the use of the site by bats since the 2022 surveys, and if there are significant changes to the land use, how this requires consideration and reflection within the masterplan.

Site Context and Status

1.5 The site lies to the west of the village of Small Dole, West Sussex, BN5 9YH (TQ 21331 13112). The site covers approximately 5.45 ha and consists of an agricultural field with hedgerows and trees on the north, west and east boundaries, and deciduous woodland to the south.

Description of Proposed Development

1.6 The proposals are for a residential development of 45 units in the southern half of the field.

Legislation

1.7 Under the NERC Act (2006) it is now the duty of every Government department in carrying out its functions "*to have regard, so far as it is consistent with the proper exercise of those functions, to the purpose of conserving biological diversity in accordance with the Convention*".

1.8 Bats are covered by the following relevant legislation: The Wildlife and Countryside Act (1981) (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006); and by the Conservation of Habitats and Species Regulations (2010).

1.9 Under the WCA 1981 it is an offence to:

- intentionally, recklessly or deliberately disturb a roosting or hibernating bat i.e. disturbing it whilst it is occupying a structure or place used for shelter or protection)

- intentionally or recklessly obstruct access to a roost (i.e. a structure or place used for shelter or protection).

1.10 Under the CHSR 2010 it is an offence to:

- deliberately capture (or take), injure or kill a bat
- intentionally, recklessly or deliberately disturb a bat, in particular (i) any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young; (ii) any disturbance which is likely to impair their ability in the case of hibernating or migratory species, to hibernate or migrate; or (iii) any disturbance which is likely to affect significantly the local distribution or abundance of the species to which they belong
- damage or destroy a breeding site or resting place (roost) of a bat.

2.0 Methodology

2.1 The surveys followed BCT guidelines (Collins, 2023) following the night time bat walkover (NBW) methodology. This involved reviewing potential roost sources and flight lines followed by transect survey. Surveyors were equipped with an Echo Meter Touch 2.

2.2 The predetermined transect route was designed to follow linear features such as hedgerows and woodland edge which bats are known to use as commuting corridors. These habitats also provide the most suitable habitat on site for foraging. Figure 2 displays the layout of the transect route.

2.3 The surveys started at sunset and observations were maintained for 1.5-2 hours. Bats usually emerge about twenty minutes after sunset depending on the species, light level, weather conditions and time of year. Peak activity will normally last for about two hours after sunset, during times of peak insect activity.

2.4 Two remote recording devices were deployed for at least five consecutive nights from May to September. These were placed within boundary features considered most suitable for foraging and commuting bats, including the feature most likely to be impacted by development, in order to gauge activity levels, species diversity, and likely

impacts on bat populations both on site and in the immediate vicinity. Their locations are shown in Figure 2. The recordings were analysed using Anabat Insight/Kaleidoscope.

Figure 2: Location of the transect route (green line) and static detector locations (blue symbol)

Limitations

2.5 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no single investigation could ensure the complete characterisation and prediction of the natural environment.

2.6 During the 2025 survey season, some static detector data were lost due to a technical issue, resulting in gaps for the remote data these two months. However, walked transects were completed in April, June, and September 2025, and static monitoring data are available for the remainder of this season, April May, June, September and October covering all of the active seasons, in line with best practice guidelines.

2.7 In addition, survey data from 2022, as well as local environmental records provide a robust baseline on bat assemblages and seasonal activity. Taken together, the 2022 and 2025 results are considered to provide a robust assessment of the use of the site by bats, and the loss of two months of static data in 2025 does not compromise the overall conclusions of this assessment.

3.0 Previous Surveys 2022

3.1 Dusk activity surveys were carried out on the May, June, July, September, and October 2022, in line with best practice guidance (BCT, 2021). Further static detector recording surveys took place in April, May, June and September.

4.1 The walked transects identified eight bat species using the site for foraging and commuting purposes: common pipistrelle, soprano pipistrelle, serotine, myotis, Leisler's, daubentons, noctule and brown long-eared bat. This was dominated by foraging common pipistrelles, with greatest frequency of passes recorded along the northern and western boundaries of the site. The static detector surveys indicated the presence of an additional four species, noctule, *Myotis spp*., barbastelle, and brown long-eared bat.

4.0 2025 Results

4.1 Bat activity surveys have been carried out on 22nd April, 17th June and 15th September 2025. The following section summarises the results from these surveys, both the walked transect and the remote recording review.

4.2 Two bat surveyors followed the predetermined route illustrated in Figure 2. Activity levels, foraging and commuting behaviour were recorded and species were identified using bat detectors. Surveyors were on site 15 minutes before sunset until 2 hours after sunset. The use of songmeter or anabat remote recording devices were placed around the site in the same locations each month as shown in Figure 2.

4.3 The date, time and weather conditions during for each monthly survey is shown in Table 1.

Table 1. Summary of the date, time and weather conditions during each transect survey.

Survey date	Time of sunset	Weather conditions
22nd April 2025	20:04	Conditions were clear and dry with temperature starting 11°C and then dropping to 10°C at the end of the survey.
17th June 2025	21:17	Conditions were clear, warm and dry with temperature starting 21°C and then dropping to 16°C at the end of the survey.
15th September 2025	19.15	Conditions at the start of the survey were cool and overcast. starting at a temperature of 16°C, 100% cloud cover and dropping to 15°C at the end of the survey.

22nd April 2025

4.4 The first activity survey commenced at sunset at 20:04 on the 22nd April. The temperature was 11°C, dropping to 10°C by the end of the survey, conditions were clear and dry.

4.5 The first bat was recorded at 20 35, when a singular soprano pipistrelle was observed foraging along the woodland boundary on the southern edge of the site. The next activity recorded was a serotine, recorded commuting from east to west along the southern boundary of the site. Two more individual noctule passes pass was recorded at 21.55, along the eastern boundary of site. No bat activity was recorded along the western or northern features and no other bat species were recorded during the survey.

17th June 2025

4.6 The survey commenced at sunset at 21:17 on the 17th June 2025. The temperature started at 16°C.

4.7 The first bat was recorded at 21:44 when a soprano pipistrelle was heard foraging near the woodland edge on the southern boundary of site. Common pipistrelles were first heard shortly after at 21:45, and were heard foraging at the woodland edge until 21:55.

At 22:31 a *Myotis* was then observed commuting south along the eastern site boundary. At 22:42, a serotine was recorded foraging along the southern site boundary. The last activity observed was a common pipistrelle foraging along the southern boundary at 23:08. No other bats were recorded during the survey period.

15th September 2025

4.8 The survey commenced at sunset, 19:15 with temperatures of 16°C. In the south of the site the first bat, a common pipistrelle, was seen foraging at 19:45, which continued for the duration of the survey. Other species observed utilising this boundary included a serotine, observed commuting east to west over the site at 20:03, and a noctule heard foraging above the boundary woodland at 20:08. The only bat recorded elsewhere was a common pipistrelle commuting across the northeastern boundary of site at 20:39. The last bat activity heard was a common pipistrelle foraging along the southern boundary at 20:54. No other bats were recorded during the survey period.

Figure 3: Summary of activity transect results

Remote Recording – Anabat Analysis

4.9 Anabat recording devices were deployed on site at locations shown previously in Figure 2. They were positioned in the south and eastern boundaries of the site and were deployed for 5 nights each on the 14th April, 13th May, 10th June, and 9th September.

April

4.10 April remote recording surveys identified a total of 6 species present on the recording devices, with species including common and soprano pipistrelle, myotis species, noctule, Leisler's bat and barbastelle.

4.11 The most dominant species present on the east position was the soprano pipistrelle, with a total of 55 call registrations. The second most recorded species were myotis species with 28 calls. There were also 23 common pipistrelle calls, 10 noctule calls, 7 leislers calls and 9 barbastelle calls over the 5 nights.

4.12 On the southern boundary location, noctules were the dominant recordings at 17 registrations, with soprano pipistrelles at 16 calls, and serotines at 12 calls. Common pipistrelle, Leisler's, barbastelles and brown long -eared bats were all recorded with less than 5 calls.

4.13 The most active recording area of the site was the eastern location recorded the most bat calls in April with 132 calls, averaging at 26.4 calls per night. The southern boundary recorded a total of 70 calls, averaging 14 calls per night The summary of results are shown in Appendix 1.

May

4.14 In May, a total of 8 species were recorded at both songmeter locations. The species recorded included common and soprano pipistrelle, myotis species, noctule, Leisler's bat, barbastelle, serotine and brown long-eared bat.

4.15 The eastern location was dominated by common pipistrelles, with 33 registrations over 5 nights, The second most recorded species were myotis species with 32 calls. There were also 22 common pipistrelle calls, 28 serotine calls, 22 soprano pipistrelle calls, 13 leislers calls, 11 brown long eared bat calls and 7 barbastelle calls over the 5 nights.

4.16 The southern location was dominated by common pipistrelles at 22 registrations. Other species included 13 soprano pipistrelle call registrations and 9 leislers calls. Low numbers of noctule, serotine and myotis species calls were also recorded.

4.17 The eastern location recorded the most bat calls in May with 155 calls averaging at 31 calls per night. The southern boundary recorded a total of 62 calls across May averaging at 12.4 calls per night . The summary of results are shown in Appendix 1.

June

4.18 In June, a total of 9 species were recorded on site. The species recorded included common, soprano and nathusius pipistrelle, myotis species, noctule, Leisler's bat, barbastelle, serotine, brown long-eared bat and serotine.

4.19 On the eastern location, common pipistrelles were again the most dominant species recorded with 70 registrations across the 5 nights. This was followed by myotis species, with 69 call registrations. Very low numbers of leislers, serotine, and brown long eared bat were recorded across the survey period, as well as individual passes from barbastelle and nathusius pipistrelle.

4.20 On the southern location the highest number of bat call registrations were recorded, a total of 620 of which 532 were common pipistrelles. The second most recorded species were soprano pipistrelles with 50 call registrations, this was followed by leislers with 15 call registrations. Low numbers of noctules, myotis species, serotines, were recorded, and individual passes from brown long-eared bat and nathusius pipistrelle were recorded throughout the survey period. The recording summary is shown in Appendix 1.

4.21 In June the most active recording location was the southern location, with a total of 620 calls averaging at 124 calls per night. The eastern location supported 235 calls averaging at 47 calls per night.

September

4.22 In September a total of seven species were recorded including common, soprano and nathusius pipistrelle, myotis species, noctule, Leisler's bat, serotine, and serotine.

4.23 The eastern location only recorded 52 call registration over the 5 nights. common pipistrelles were again the most dominant species recorded with only 23 registrations across the 5 nights. This was followed by soprano pipistrelle species, with 18 call registrations. Very low numbers of leislers, myotis and noctule were recorded across the survey period.

4.24 The southern location recorded the highest number of calls, a total of 63 of which 35 were common pipistrelles.. The recording summary is shown in Appendix 1.

4.25 In September the most active recording location was the southern location, with a of 63 calls recorded across 5 nights averaging 12.6 calls per night. The eastern location supported 52 calls averaging at 10.4 calls per night.

4.26 This data, alongside previous data from 2022 surveys, has been used to inform any updates with regards to compensation and mitigation measures, including the design of the site.

Results Summary

4.27 The following tables summarise the data collected on site during the 2025 survey period.

Table 2: Total bat passes recorded by static detector by species

Bat species	Total number of recordings	Percentage of total
Common Pipistrelle	743	53.53%
Soprano Pipistrelle	206	14.84%
Myotis sp.	156	11.24%
Noctule	107	7.71%
Serotine	65	4.68%
Leislers	62	4.47%
Brown Long-eared bat	26	1.87%
Barbastelle	19	1.37%
Nathusius pipistrelle	4	0.29%
Total	**1388**	

4.28 It can be seen from Table 3 that activity was heavily dominated by common pipistrelles. Soprano pipistrelles and myotis species are also considered to be well represented across the site.

4.29 All other species are considered to have low-level use, with barbastelle, brown long eared bat and nathusius pipistrelle being the most infrequent.

4.30 Table 3 shows the total number of passes recorded at each Anabat location within each month.

Table 3: Total bat passes recorded each month by location in 2025

Anabat Location	**Total number of passes per month**				
	April	May	June	September	**Total**
East	132	155	235	52	574
South	69	62	620	63	814
Total	201	217	855	115	1388

4.31 It can be seen from Table 4 that higher levels of activity were present along the southern site boundary across the course of the survey season, with lower levels of activity at the on the eastern boundary of the site. The eastern boundary supports fairly low levels of calls throughout the season, with low numbers recorded during all of the months, with a slightly higher number of calls in June. Whereas the southern boundary supports very low numbers in April, May and September, but with a significant uplift in June.

4.32 Table 3 also shows the highest levels of activity occurred in June in both locations, with the lower levels of activity occurring across all months, but notably lower in September.

4.33 Table 4 shows the total number of passes made per species at each Anabat location. The table also shows the average number of passes per night per species at each Anabat location. No call registration were recorded on some nights, and this has been considered when calculating the average.

Table 4: Number of passes made by each species and average pass per species per night at each Anabat location

	Eastern location		Southern location	
	Number of passes	**Average passes per night**	**Number of passes**	**Average passes per night**
Common Pipistrelle	149	7.45	594	29.7
Soprano Pipistrelle	109	5.45	88	4.4
Myotis sp.	132	6.6	29	1.45
Noctule	64	3.2	43	2.15
Leislers	33	1.65	24	1.2
Serotine	38	1.9	27	1.35
Barbastelle	17	0.85	4	0.2
Brown Long-eared bat	22	1.1	3	0.15
Nathusius pipistrelle	1	0.05	2	0.1
Total	**574**		**814**	

4.34 It can be seen that there are differences between the two locations, with notably lower numbers of species recorded at the southern location. The average passes per night for pipistrelle species, leislers, and nathusius pipistrelle were higher in the southern location, with myotis, noctule, serotine, barbastelle and brown long eared bats having higher numbers of calls in the eastern location.

4.35 It must be noted that low levels of serotine, noctules and leislers were recorded in all locations.

5.0 Discussion

Site Suitability

5.1 The site comprises largely sub-optimal habitat for foraging and commuting bats with the site largely supporting poor condition other neutral grassland. This grassland lacks the diversity in terms of species richness. However, the site supported good connectivity within the wider landscape, notably the edges of the site where the woodland on the

southern boundary and scrub on the eastern and western boundaries extend to the wider landscape. These features were considered to be of reasonable value for bats.

5.2 The eastern boundary of the site is defined by the A2037 Henfield Road, which connects Henfield to larger routes including the A283 towards Worthing, Shoreham, and Brighton. Although not a major trunk road, the A2037 carries frequent traffic, creating noise, movement, and light disturbance that reduce the suitability of this boundary habitat for bats. Roads are known to act as partial barriers to bat movement and can increase the risk of collision while simultaneously reducing insect prey availability. The presence of streetlighting on the road to both the north and south of the site further diminishes the overall quality of the linear feature by disrupting natural light levels, a factor particularly relevant to light-sensitive species such as barbastelle and myotis bats (Fensome & Mathews 2016). Additional artificial lighting from residential development on the opposite side of the road compounds this effect on the eastern site boundary. While a narrow strip of linear scrub is present along this boundary and provides some structural cover, its ecological value as a commuting or foraging feature for bats is considered low due to the combined effects of traffic, lighting, and urban disturbance.

5.3 The southern and western boundary of the site support trees, woodland and scrub, and these features, provide optimal habitat for foraging and commuting bats. Furthermore, these features are connected to the wider landscape, linking the on site habitat to wider ecological networks.

5.4 The development does not impact upon the ecological functionality of the landscape. The BNG report identified that there is a net gain in the value of the on site habitats and river corridor habitats by 24.82% and 10.12% respectively.

Bat Species and Activity

5.5 The 2022 and 2025 walked transect activity surveys recorded relatively few bat calls overall. In 2025, common pipistrelle and soprano pipistrelle were the most frequently detected species; however, their activity levels were still low, with only low average numbers of calls per location. All other species were detected at even lower levels, with only Myotis species exceeding an average of five calls per night. This was consistent with the 2022 walked transects.

5.6 The 2025 surveys placed remote recording devices in two separate locations and were established in April, May, June, and September. The surveys identified that the month of September had the lowest number of bat registrations with June showing the highest levels of activity. The remaining months showed overall low levels of activity.

5.7 Myotis calls were grouped together as they could not be confidently identified to species; these have been grouped in the general 'myotis species' category but could include multiple species. Other species recorded included common, soprano and Nathusius pipistrelles, noctule, serotine, Leisler's, brown long eared bat and barbastelle, were all recorded across the site.

5.8 Barbastelle bats are an Annexe II species, and therefore considered to be a notable find. Barbastelles were only recorded in low numbers on the static detectors, with a total of 19 passes across the entire survey period. The timing of the calls recorded across all survey months were at least 50 minutes after sunset, and with the mean average emergence time for the species as 24 minutes (Zeale *et al*, 2012), it is considered unlikely that a roost is present within the immediate vicinity.

5.9 The highest number of barbastelle calls was recorded in April on the eastern boundary, with 9 out of the total 19 calls detected. The second highest number was also recorded at the eastern boundary in May with 7 calls, followed by a single call in June at the same location. No barbastelle calls were recorded in September..

5.10 The concentration of records on the eastern boundary, a linear scrub feature with a busy A-road and residential development on its eastern side, suggests that occasional activity may reflect transient commuting or opportunistic foraging rather than regular or sustained use. Given the low number of calls, the irregularity of the calls across the survey period, and the absence of recent biological records, the site is not considered to represent important habitat for barbastelles.

5.11 Instead, it is therefore considered likely that barbastelles opportunistically use the eastern boundary of the site as a commuting corridor between two significant areas of ancient woodland in the local landscape: Tottington and Longlands Wood, located

approximately 300 m to the southeast, and Hoe Wood, approximately 300 m to the northeast. Additional important foraging habitat occurs to the northeast, including Woods Mill Nature Reserve and the network of tributaries feeding into the River Adur. The limited and sporadic detections of barbastelles at the site suggest that use is transient, with bats likely following linear features such as the eastern scrub boundary to navigate between these larger woodland and riparian habitats.

5.12 The remaining species recorded utilising the site are considered to be common and widespread throughout the UK, with pipistrelle species dominating 68% of the calls recorded on site.

Anabat Data

5.13 Higher levels of bat activity were recorded across the site on the Anabat detectors in comparison with the walked transect surveys, with the highest levels of activity overall being recorded in June. However, it must be noted that remote recording does not distinguish between a single individual making numerous passes whilst foraging around a particular feature, and between more numerous individual bats commuting across the landscape. As such, walked transects provide a good understanding of how a particular feature is being used.

5.14 The majority of bat passes recorded on site during both the walked transects and remote recording surveys, were from common and soprano pipistrelles, with a total average of approximately 18 and 5 passes per night respectively across both Anabat locations. These species are both common and widespread across the UK, with population estimates of 3,040,000 and 4,670,000 respectively (Mathews *et al*., 2018). Foraging bats likely produce repeated passes within a small area whilst hunting for invertebrates and this was confirmed during the transects when a single individual was found to produce numerous passes by simply foraging up and down the southern woodland edge. Therefore, the number of common and soprano pipistrelles passes recorded on the remote recording on site are therefore considered likely to result from a moderately small number of foraging bats.

5.15 A number of myotis species calls were also recorded on site, averaging approximately 6.6 passes per night in the eastern location across the survey period. There were lower

numbers of passes in the southern locations, with an average of 1.2 passes. Like barbastelles, it is therefore considered likely that Myotis species are utilising the eastern boundary as a transient, opportunistic commuting feature to commute between areas of high-value foraging and roosting habitat within the wider landscape.

5.16 Low activity levels of serotines, noctules, brown long-eared bats, leislers and nathusius pipistrelles were identified onsite, with an average of 2.5 or less passes per night on each Anabat. As such, these species are considered to use the site on an occasional basis and that the site do not form part of their core foraging habitat.

5.17 In 2022, brown long eared bats or nathusius pipistrelle were not recorded on site. While these species were both recorded in 2025, they had 25 and 4 calls respectively across the entire survey period. Other significant changes include a notable increase in the percentage of common pipistrelle calls, and a similar sized decrease in soprano pipistrelle calls Table 5 below demonstrates the change in % of calls for each species across the two survey efforts.

Table 5: Number of passes made by each species in 2022 and 2025. The colours indicate an increase (green), decrease (red) or negligible change (orange) since 2022

Bat Species	% of calls in 2022	% of calls in 2025
Common Pipistrelle	27.23%	53.53%
Soprano Pipistrelle	41.73%	14.84%
Myotis sp.	11.78%	11.24%
Leisler's	3.30%	4.47%
Noctule	3.51%	7.71%
Serotine	12.20%	4.68%
Barbastelle	0.27%	1.37%
Brown Long-Eared Bat	0.00%	1.87%
Nathusius pipistrelle	0.00%	0.29%

Impacts from Development

5.18 Impacts to bats from development can occur either directly, through direct habitat loss and fragmentation, or indirectly, mostly through light pollution. The proposed site plan is shown in figure 3 below.

Figure 3: Proposed site layout

5.19 The scheme has been designed to retain and buffer the existing site, avoiding impacts through the loss or further severance of flightlines. The development is largely contained within the grassland on site, which is considered to be low value for bats due to a lack of structural and species diversity. The large amount of open space provides plenty of opportunity to enhance the value of the site for bats.

5.20 To provide access for the development, a short section of the eastern site boundary will be removed to create access roads. This new access point will be located slightly north of the existing gap, which will be replanted with scrub. Scrub will also be retained on

both sides of the new access, with planting designed to overhang and form an aerial bridge. This will help bats and birds cross the road by reducing the open gap within the linear feature.

5.21 SuDs, new street trees and new rural trees and new species rich grassland are all proposed in the extensive areas of open space provision and within the development boundary. The proposals provide for a significant ecological enhancement, creating new habitats and ecotones which would benefit invertebrates as well as bat species.

Lighting scheme

5.22 As it has been identified that a number of bat species use of the boundary features on site, it is recommended that light should be directed away from these features, maintaining these as 'dark corridors'. The southern and eastern boundary habitats in particular, are areas of higher activity for bats, where low levels of levels of lighting are highly recommended as these areas have been shown to be a key foraging and commuting route by light sensitive species such as myotis species and barbastelle.

5.23 Dark corridors must be maintained along the linear features through the inclusion of dark buffer zones along the habitat edges of the site. Lighting can alter bat behaviour significantly in terms of light avoidance with some species unable to cross lit areas even at low light levels. For example, Myotis species which are on site, are known to avoid all street lights (Stone et al., 2009, 2012, 2015). Therefore, the development could impact the abundance of these species on site post-development without careful design and mitigation.

5.24 In addition, lighting can affect the availability of insect prey with some groups attracted to lights, creating a 'vacuum effect' in adjacent habitats.

5.25 Therefore, where lighting is required on site, a sensitive lighting scheme must be implemented. Again, collaboration between a lighting professional and ecologist may be required in order to help design this scheme but measures should include:

- The impact on bats can be minimised by the use of Light emitting diodes (LEDs) instead of mercury, fluorescent or metal halide lamps where glass glazing is

preferred due to their sharp cut-off, lower intensity and their dimming capability. Lighting should be directed to where it is needed and light spillage avoided.

- This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only.
- Soft landscape planting should also be used as a barrier or manmade features such as walls or fencing with planted climbers where required within the build can be positioned so as to form a barrier between any development and the linear features used by bats.

5.26 The western boundary has very low bat activity recorded throughout the walked activity transect. This boundary feature includes a thin strip of bramble-dominated scrub. Proposals include planting this boundary with native mixed scrub, which will increase the value of this boundary for bats.

5.27 All construction works will be completed in the daytime when the bats are not active and potential sources of noise/vibration will be positioned away from the site boundary features, therefore impacts relating to noise/vibration are considered highly unlikely.

5.28 It is considered that the development retains key landscape features and incorporates multiple enhancements, including scrub planting, 108 new native trees, and SuDS. With sensitive lighting design, impacts are not considered significant and the scheme is expected to deliver measurable ecological benefits for bats at the site scale.

Enhancements

Roost enhancements – boxes

5.29 Bat boxes should be erected on the existing mature trees along the southern boundary of the site. This will enhance the local bat population and provide roosting opportunities. Woodcete boxes, or similar are recommended as they are durable and support good thermal properties. Recommended boxes include:

- Vivara Pro WoodStone Bat Box – A general purpose bat box that supports a range of species (Figure 4). These can be hung on trees in a variety of heights and aspects in order to provide a variety of micro-climates.

- Large Multi Chamber WoodStone Bat Box – This is a multipurpose box designed for larger colonies and a range of bat species including pipistrelles, noctules and brown long-eared bats. These should be hung on mature trees around the site (Figure 4).

Figure 4: Vivara Pro WoodStone Bat Box (left) and Large Multi Chamber WoodStone Bat Box (right)

5.30 The development can also incorporate bat tubes integrated into the new buildings on site. It is recommended that either the Vivara Pro Build-in Woodstone bat box or the Habibat Bat Box 001 are used (Figure 5). They are unobtrusive and can fit flush into masonry of a wall during the construction phase. It is recommended that these be placed on the walls of houses close to south western and north eastern woodlands.

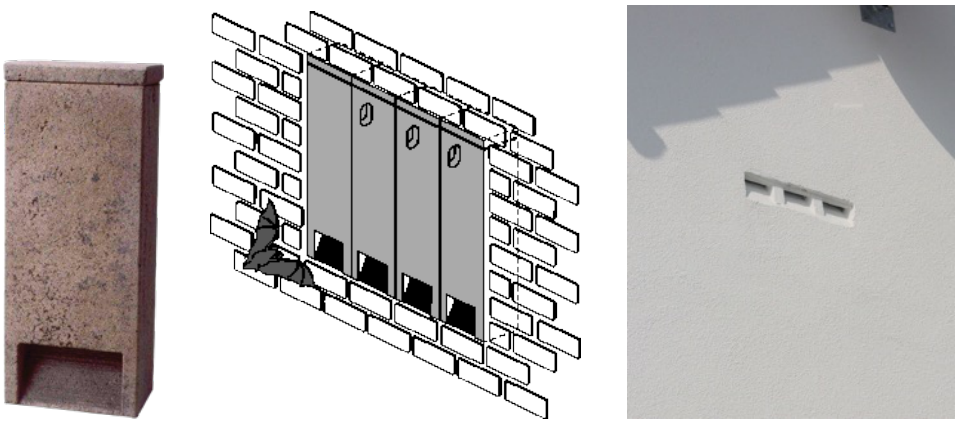

Figure 5: Use of bat tubes recommended within newly built houses on site

Additional planting schemes

5.31 A number of trees are to be planted across the site. These provide foraging opportunities for bats through provision of insect prey, as such it is recommended a number of the below native tree species are considered. This will help to improve wildlife corridors around the site for species such as badgers, amphibians, small mammals and birds. The following species are recommended to be used in enhancing existing hedgerows and in the creation of individual trees across the site:

- Oak (*Quercus robur*)
- Rowan (*Sorbus aucuparia*)
- Elder (*Sambucus nigra*)
- Goat willow (*Salix caprea*)
- Hazel (*Corylus avellana*)
- Hornbeam (*Carpinus betulus*)
- Common alder (*Alnus glutinosa*)
- Hawthorn (*Crataegus monogyna*)
- Blackthorn (*Prunus spinosa*)
- Field maple (*Acer campestre*)
- Dog rose (*Rosa canina*);

5.32 Gardens in developed areas can provide suitable foraging habitat for bats, in particular for pipistrelle species. It is recommended that planting includes native species that are of particular benefit to bats such as night-flowering species that attract night-flying invertebrate prey. The following native species are considered suitable:

- Nottingham catchfly (*Silene nutans*)
- Night-flowering catchfly (*Silene noctiflora*)
- Bladder campion (*Silene vulgaris*)
- Soapwort (*Saponaria officinalis*)
- Wild marjoram (*Orignaum vulgare*)
- Borage (*Borago officinalis*)
- Yarrow (*Achillea millefolium*)
- Primrose (*Primula vulgaris*)
- Corn marigold (*Glebionis segetum*)
- Perforate St John's-wort (*Hypercium perforatum*)

- Wood forget-me-not (*Myosotis sylvatica*)
- Ox-eye daisy (*Leucantheum vulgare*)

5.33 Climbing plants can be grown onto trellis along the fence line dividing the two gardens. Species which can be planted include:

- Honeysuckle (*Lonicera japonica; L. fragantissima; L. standishii*);
- Clematis (*Clematis vitalba, C. armandii, C. alpina, C. montana, C. tangutica*);
- Ivy (*Hedera helix*);
- Climbing hydrangea (*Hydrangea petiolaris*);
- Dog rose (*Rosa canina*).

5.34 The SuDS could be planted with a grass and wildflower mixture which can survive becoming seasonally wet. This habitat will create new foraging opportunities for bats. A pond edge mix is proposed for use along the main water retention areas and should contain wildflowers and grasses suitable for sowing at the margins of pond, streams and ditches. The mixture proposed includes:

- Sneezewort (*Achillea ptarmica*)
- Wild Angelica (*Angelica sylvestris)*
- Marsh Marigold (*Caltha palustris*)
- Hemp Agrimony (*Eupatorium cannabinum*)
- Meadowsweet (*Filipendula ulmaria*)
- Square-stalked St John's Wort (*Hypericum tetrapterum*)
- Yellow Iris (*Iris pseudacorus*)
- Greater Birdsfoot Trefoil (*Lotus pedunculatus*)
- Gypsywort (*Lycopus europaeus*)
- Purple Loosestrife (*Lythrum salicaria*)
- Meadow Buttercup (*Ranunculus acris*)
- Water Figwort (*Scrophularia auriculata*)
- Ragged Robin *Silene flos-cuculi - (Lychnis flos-cuculi)*
- Devil's-bit Scabious (*Succisa pratensis*)
- Common Meadow-rue (*Thalictrum flavum*)
- Tufted Vetch (*Vicia cracca*)
- Meadow foxtail (*Alopecurus pratensis*)

- Sweet vernal-grass (*Anthoxanthum odoratum*)
- Crested dogstail (*Cynosurus cristatus*)
- Tufted hair grass (*Deschampsia cespitosa*)
- Common bent (*Agrostis capillaris).*

5.35 Log and brash piles have been recommended for the site to provide refugia and hibernacula for reptiles, at the edges of the site. They are also important for saprophytic bryophytes and saprophytic insects, and in turn bats. They should be placed in a variety of locations (damp and sunny spots) and next to existing vegetation, such as the hedgerows, treelines and woodland edge, so that there is cover immediately adjacent. They should contain a mixture of log piles and shapes with some small diameter material to create a diverse structure (Figure 6). Climbing plants previously mentioned can also be used to add value.

Figure 6: Use of log piles to be used across the site.

6.0 Conclusions

6.1 The site supports linear scrub and woodland along the site boundaries, which provide suitable foraging and commuting habitats for bats, also providing connectivity both on and off site. Therefore, further bat activity surveys were considered necessary to determine how bats utilise the site and if there has been a change of usage since the 2022 surveys

6.2 A transect route along the linear boundary features was followed on the 22nd April, 17th June and 15th September 2025. The transect surveys identified low levels of bat activity across the site, with activity on site being dominated by common and soprano

pipistrelles. Other bat species were recorded in low numbers including serotine, myotis species and noctules.

6.3 Two Anabat detectors were placed on site each month between April to October 2025. Due to unforeseen circumstances, data was not available for July and August. The static detectors recorded higher levels of bat activity on site and recorded a greater variety of bat species on site than on the walked transects. The southern location recorded the most call registrations onsite with 814 calls. The results of all surveys suggest the site is largely used by common bat species such a soprano and common pipistrelles as well as myotis species. The main areas for foraging identified from the walked transects and remote recording were the boundary woodland to the south, whilst the eastern boundary was primarily used for commuting. These features will be predominantly retained and enhanced part of the development to ensure bats can move with ease across the landscape.

6.4 In total, 9 different species were identified using the site during the survey effort. The dominant species recorded was common pipistrelles, with soprano pipistrelles and myotis species frequently recorded. Low level use of the site by other species, including serotine, noctules, brown long eared bats, Leisler's, Nathusius pipistrelle and barbastelle were also recorded.

6.5 Current proposals will retain and enhance most of the boundary features. Where gaps in linear features are created to road access, supplementary scrub planting on either side of the road with overhanging branches will reduce the gap over which bats have to cross. These boundary features should be maintained as darkened corridors with minimal nearby lighting and a sensitive lighting scheme should also be conditioned to further minimise the potential for impacts to bats.

6.6 Recommendations have been made to also include soft landscape planting schemes and a SuDS Pond which will create new foraging opportunities for bats in the local area. If these recommendations are adhered to, it is considered that the favourable conservation status of all bat species using the site will be maintained post-development.

7.0 References

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Appendix 1: Raw Bat Data

April

April East

Species/Night	17/4	18/4	19/4	20/4	21/4	Total
Pip45	3	4	0	7	9	23
Pip55	2	27	2	6	18	55
NYCNOC	3	0	6	0	1	10
NYCLEI	3	3	1	0	0	7
MYO	2	4	3	8	11	28
BARBAR	1	3	0	0	5	9
Total	14	41	12	21	44	132

April South

Species/Night	17/4	18/4	19/4	20/4	21/4	Total
Pip45	1	1	1	2	0	5
Pip55	2	3	1	6	4	16
NYCNOC	8	2	1	3	3	17
NYCLEI	1	0	0	0	0	1
MYO	2	1	1	4	5	13
BARBAR	0	0	0	0	2	2
BLE	1	0	1	0	1	3
SERO	5	1	1	1	4	12
Total	20	8	6	17	19	70

May

May East						
Species/Night	**13/05**	**14/05**	**15/05**	**16/05**	**17/05**	**TOTAL**
Pip45	15	2	3	11	2	**33**
MYO	5	9	6	6	6	**32**
SERO	14	4	2	4	4	**28**
Pip55	7	3	6	2	4	**22**
NYCLEI	9	2	0	1	1	**13**
BLE	1	3	2	4	1	**11**
NYCNOC	1	4	2	0	2	**9**
BARBAR	1	1	1	4	0	**7**
Total	53	28	22	32	20	155

May South						
Species/Night	**13/05**	**14/05**	**15/05**	**16/05**	**17/05**	**TOTAL**
Pip45	2	3	2	4	11	22
Pip55	2	0	4	4	3	13
NYCLEI	2	1	1	1	4	9
SERO	4	1	1	0	3	9
NYCNOC	1	0	3	0	1	5
MYO	3	0	1	0	0	4
BARBAR	0	0	0	0	0	0
BLE	0	0	0	0	0	0
Total	14	5	12	9	22	62

June

Species/Nigl	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	TOTAL
Pip45	25	14	8	2	21	**70**
MYO	18	18	11	12	10	**69**
NYCNOC	16	3	8	14	3	**44**
Pip55	7	3	4	5	4	**23**
BLE	1	1	3	3	3	**11**
SERO	4	1	0	4	1	**10**
NYCLEI	3	0	3	0	0	**6**
BARBAR	0	0	0	0	1	**1**
PIPNAT	0	0	0	1	0	**1**
Total	74	40	37	41	43	235

June South

Species/Nigl	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	TOTAL
Pip45	27	5	11	3	486	532
Pip55	11	2	6	17	14	50
NYCLEI	0	1	0	14	0	15
NYCNOC	8	1	2	1	2	14
MYO	3	0	0	0	1	4
SERO	2	1	0	0	0	3
BLE	0	0	0	1	0	1
PIPNAT	1	0	0	0	0	1
BARBAR	0	0	0	0	0	0
Total	52	10	19	36	503	620

September

Sept East

Species/Nigl	9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	TOTAL
Pip45	17	0	0	1	5	23
Pip55	17	1	0	0	0	18
NYCLEI	6	0	0	1	0	7
MYO	3	0	0	0	0	3
NYCNOC	1	0	0	0	0	1
BARBAR	0	0	0	0	0	0
SERO	0	0	0	0	0	0
BLE	0	0	0	0	0	0
PIPNAT	0	0	0	0	0	0
total	44	1	0	2	5	52

Sept South

Species/Nigl	9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	TOTAL
Pip45	22	0	2	6	5	35
Pip55	2	0	2	1	4	9
NYCNOC	1	1	4	0	1	7
NYCLEI	0	0	0	4	0	4
MYO	1	0	0	0	2	3
SERO	1	0	1	0	1	3
PIPNAT	2	0	0	0	0	2
BARBAR	0	0	0	0	0	0
BLE	0	0	0	0	0	0
Total	29	1	9	11	13	63

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