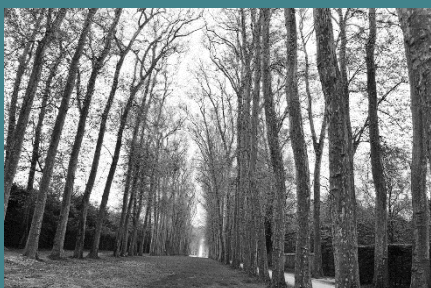


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APPENDIX 7.5

Bat Survey Report

Client

Hallam Land Management Limited

Project

**Land East of Knowsley Lane,
Knowsley**

Date

October 2025

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B	Issue	JB / 02.10.25	GP / 03.10.25
C	Issue	YK / 13.10.25	ET / 13.10.25

1.0 INTRODUCTION

- 1.1 The following report has been prepared by FPCR Environment and Design Ltd (FPCR) on behalf of Hallam Land Management Limited with respect to Land East of Knowsley Lane, Knowsley (central OS Grid Reference SJ436947) hereafter referred to as the 'Site'.
- 1.2 This document provides a summary of the results of seasonal bat transect and monthly static detector surveys undertaken between September 2024 and August 2025. The objective of the bat surveys was to assess the value of the Site for foraging and commuting bats by gathering data on the species, abundance and utilisation of various areas and features of the Site.

Site Proposals

- 1.3 The proposals for the Site include up to 700 new dwellings with associated access and gardens. Green infrastructure proposals include the retention and enhancement of existing woodland and scrub and creation of additional native mixed scrub, individual trees, species rich grassland and woodland. This will provide a buffer and enhancement to retained woodland habitat. Other habitats include formal and informal amenity grassland areas, a traditional orchard and ornamental planting.

2.0 LEGISLATION

Legislation

- 2.1 All bats and their roosts are afforded legal protection under the Conservation of Habitats and Species Regulations 2017 (as amended) (CHSR) and the Wildlife & Countryside Act 1981 (as amended) (WCA).
- 2.2 The purpose of the legislation is to maintain and restore protected species to a situation where their population status is favourable.
- 2.3 Schedule 2 of the CHSR lists all bats belonging to the families *Vespertilionidae* and *Rhinolophidae* as European Protected Species (EPS) of animals. This includes all known UK bat species.
- 2.4 Under Regulation 43 of the CHSR it is an offence to
- Deliberately capture, injure or kill a bat;
 - Deliberately disturb a bat; and
 - Damage or destroy a breeding site or resting place of a bat.
- 2.5 The definition of disturbance in CHSR is an act that is likely to impair the ability of an EPS to survive, breed, rear, and nurture young, hibernate or migrate, or to significantly affect the local distribution or abundance of the species.
- 2.6 It is also an offence under Regulation 43 to be in possession or to control or to transport and live or dead or part of a bat.
- 2.7 Schedule 5 of the WCA lists all bats belonging to the families *Vespertilionidae* and *Rhinolophidae* as animals which are protected by sections 9(4)(b) 9(4)(c). This includes all known UK bat species.
- 2.8 Under the above sections it is an offence to intentionally or recklessly:
- Disturbs any bat while it is occupying a structure or place which it uses for shelter or protection; or
 - Obstructs access to any structure or place which a bat uses for shelter or protection.
- 2.9 Foraging habitat and commuting routes used by bats are not directly protected as such but impacts that could prevent bats from using a resource or commuting to or from a valued roosting site may be considered as an indirect impact on a roost or a significant disturbance effect and would therefore also need to be avoided or prevented.
- 2.10 Several bat species are listed as species of principal importance for the purpose of conserving biodiversity under the Natural Environment and Rural Communities (NERC) Act 2006. These species are barbastelle bat, Bechstein's bat, brown long-eared bat, greater horseshoe bat, lesser horseshoe bat, noctule and soprano pipistrelle.

Policy

National

- 2.11 The government planning policies for England and how these are utilised is set out in the National Planning Policy Framework (revised in 2024). Species of Principle important under the NERC Act 2006 are recognised in the National Planning Policy Framework (NPPF) which advises that when determining planning applications, Local Planning Authorities should aim to conserve and enhance biodiversity by applying a set of principles including:

- *If significant harm resulting from a development cannot be avoided...adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
- *Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.*

Local

- 2.12 The North Merseyside Biodiversity Action Plan for Bats (2008) covers the following species:

- Common pipistrelle *Pipistrellus pipistrellus*;
- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Brown long-eared bat *Plecotus auritus*;
- Whiskered bat *Myotis mystacinus*;
- Brandt's bat *Myotis brandtii*;
- Natterer's bat *Myotis nattereri*;
- Daubenton's bat *Myotis daubentonii*; and
- Noctule *Nyctalus noctule*.

- 2.13 The document lists proposed actions for the protection of bats, including:

- *Section 6.1 Site safeguard*
 - *'Promote the expansion of biodiverse urban green infrastructure within the Local Development Frameworks.*
- *Section 6.3 Land management*
 - *'Encourage landowners to retain old and dead trees suitable as bat roosts.'*
 - *'Promote creation and suitable management of linear features (such as hedgerows, streams, ditches, canals etc) to increase linkage between feeding sites.'*
 - *'Promote suitable management of field margins to increase availability of insect prey.'*
- *Section 6.4 Species management and protection*
 - *'Provision of artificial roost sites can be beneficial but should not be considered as an easy option to retaining suitable natural roost sites for breeding or hibernation. All bat roosts should be considered equally important and essential to the species survival.'*

3.0 METHODOLOGY

Desk Study

3.1 A desk study was undertaken to collate existing information for the Site and its surroundings in relation to bat species. This included a review of:

- Biological records requested from Biobank Merseyside (the local biodiversity records centre of North Merseyside);
- Granted EPS licences for bats from the Multi Agency Geographic Information for the Countryside (MAGIC) website;
- Statutory designated sites that include bat species as part of their designation from MAGIC; and
- Publicly available aerial imagery showing connectivity across the Site and to the wider landscape.

3.2 Bat records were searched for at a resolution of 2km around the Site.

Bat Roosting Suitability

Preliminary Roost Assessments

3.3 There are no buildings or structures on Site. Preliminary Roost Assessments (PRA) of trees were undertaken from ground level, with the aid of binoculars by a suitably experienced ecologist from FPCR 8th and 9th May 2025. Potential Roosting Features (PRFs) (based on p.16, British Standard 8596:2015 Surveying for bats in trees and woodland, October 2015) which were sought included:

- Natural holes (e.g. knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar;
- Man-made holes (e.g. cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems;
- Woodpecker holes;
- Cracks/splits in stems or branches (horizontal and vertical);
- Partially detached, loose or platy bark;
- Cankers (caused by localised bark death) in which cavities have developed;
- Other hollows or cavities, including butt rots;
- Compression of forks with occluded bark, forming potential cavities;
- Crossing stems or branches with suitable roosting space between;
- Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk); and
- Bat or bird boxes.

- 3.4 Certain factors such as orientation of the feature, its height from the ground, the direct surroundings, and its location in respect to other features may enhance or reduce the potential value.
- 3.5 Using professional judgement, the ground-based PRA assessment classified any trees identified based upon the presence of suitable features as set out in Bat Surveys for Professional Ecologists: Good Practice Guidelines (BCT, 2023) in which the general bat roost potential groups are defined (refer Table 4.2 of the guidelines) and provided in Table 1 below.

Table 1: Suitability of trees for bats

Suitability	Description
NONE	Either no potential roost features or highly unlikely to be any
FAR	Further Assessment Required to establish if Potential Roost Features are present.
PRF	A tree with at least one Potential Roost Feature

Bat Activity

Habitat Assessment

- 3.6 This assessment was undertaken to identify the suitability of the Site to foraging and commuting bats or areas which may be important for exhibiting various social behaviours. This was informed by the results of the initial UKHab survey in 2022, the updated Site walkover in 2025, and from information gathered in the desk study to ensure that potential effects are considered in the context of the onsite habitats within the wider area.
- 3.7 The Site was also categorised for its habitat suitability for bats, which would inform the necessary survey effort. The habitat suitability was assessed using guidance from 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (Bat Conservation Trust, 4th Edition, 2023). Table 4.1 of those guidelines provides an outline for assessing the potential suitability of proposed development Sites for bats, based on the presence of habitat features within the landscape. This should be applied using professional judgement. This groups a Site into five categories based on habitat suitability for foraging and commuting bats which has been further summarised in Table 2, below:

Table 2: Criteria for Assessing Habitat Suitability for Commuting and Foraging Bats - Based on table 4.1 (Collins, 2023)

Suitability	Potential Flight Paths and Foraging Habitat	Proposed Further Survey Requirements
None	No habitat features on Site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/protection for flight-lines or generate/shelter insect populations available to foraging bats).	No further surveys required
Negligible	No obvious habitat features on Site likely to be used as flightpaths or by foraging bats; however,	

	a small element of uncertainty remains in order to account for non-standard bat behaviour.	
Low	Habitat that could be used by small numbers of bats as flightpaths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.	Automated static detector monitoring and nighttime bat walkover surveys (flight path and transect) on a <u>seasonal</u> * basis.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for flightpaths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.	Automated static detector monitoring on a <u>monthly</u> basis and nighttime bat walkover surveys (flight path and transect) on a <u>seasonal</u> * basis.
High	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.	
*Seasonal surveys should be increased to monthly where Annex II species are expected/ detected or if significant commuting routes are identified.		

Bat Activity Surveys

- 3.8 Bat activity surveys were undertaken because the Site was considered to provide moderate to high suitability for bats. These surveys were undertaken to identify the value of the Site to foraging and commuting bats or areas which may be important for exhibiting various social behaviours so that the effects of the proposals can be assessed.
- 3.9 In order to inform an impact assessment, where possible the bat activity surveys aim to identify:
- The presence or absence of bats, abundance and species using the Site whilst away from the roost;
 - The usage of the habitats on the Site by bats;
 - The temporal (both seasonally and nightly) and spatial distribution of recorded bat activity on Site and any associations in terms of timings or particular features;
 - Any connectivity in terms of habitats within the Site and/or the surrounding area;

- The effect of any existing lighting on the existing bat population.

3.10 Bat activity surveys were designed and managed by an ecologist with expertise meeting the BCT level 3 competency and lead by appropriately experienced ecologists.

Static Monitoring

3.11 Static (passive) monitoring was undertaken using an automated logging system (Wildlife Acoustics Inc. Song Meter® SM4BAT FS bat detectors with SMM-U2 microphones). During the survey period September – October 2024 and April – August 2025, static recording devices were positioned within the Site to record bat registrations for at least five consecutive nights per month.

3.12 The number of static detectors to be used and location of deployment was determined so that a representative sample of all habitats within the Site could be monitored. The locations were subjectively predetermined using professional judgment to be positioned at least 15m away from any known or likely roosts and also in consideration of likely impacts. In order to provide rigorous analysis, static detectors were placed in the same location during each survey, and these are shown on Figure 7.5.4.

3.13 The devices were deployed for five consecutive nights during suitable weather conditions that were typical for the month of deployment and were programmed to activate 30 minutes before sunset and record continuously until 30 minutes following sunrise.

3.14 Static detectors were deployed during the following periods;

- 26th September to 1st October 2024
- 16th to 21st October 2024
- 16th to 21st April 2025
- 7th to 12th May 2025
- 4th to 9th June 2025
- 3rd to 8th July 2025
- 1st to 7th August 2025

3.15 The data were analysed as soon as possible after retrieval of the static units using the Sonobat™ 30.1 (SonoBat™ Inc.) software package. Data were initially run through the auto-analysis function of the software and then were subject to moderated vetting by a bat call specialist, informed by guidance from an independent statistician. Analysts are audited internally for quality control purposes and to maintain consistent results. Measurements including peak frequency, inter-pulse interval, call duration and end frequency were taken to aid in species identification.

Night-time Bat Walkover (Flightpath / Transect Surveys)

3.16 In line with current guidance (Collins, 2024) night-time bat walkovers are undertaken in two parts. The first part is undertaken by stationary surveyors positioned on habitat features most likely to be utilised as commuting routes by bats. Once conditions become too dark to see or once commuting activity has been observed and has largely ended, surveyors begin a walked transect sampling all areas and habitats within the Site noting any bat activity that is heard or

observed along the way. Whilst this includes two elements it is one survey designed to record information to provide further context to elements that static detectors cannot always identify such as bat behaviour or abundance of bats.

- 3.17 The first part of the survey to observe flightpaths involved two surveyors being positioned at pre-determined locations as shown on Figure 7.5.5. The survey started just before sunset and lasted for between 30 minutes and one hour after sunset. After this the walked transect was started and continued until two to three hours after sunset. The route followed during each transect was repeated on each survey occasion, however the starting point was varied throughout the seasons. Figure 7.5.6 shows the route of the transect and the start/ end points of each survey.
- 3.18 Surveyors were equipped with Wildlife Acoustics Inc. Echo Meter Touch® bat detectors and Samsung Galaxy Tab Active 3® with the Echo Meter Touch® app during the transect surveys to detect bats and aid species identification. During the survey any bat activity and behaviour observed was recorded.

Table 3: Nighttime Bat Walkover Timings

Survey Date	Sunset Time	Start Time (commuting)	Start Transect	End Transect
10/10/2024	18:26	18:11	19:27	20:32
16/04/2025	20:36	20:36	21:36	22:45
03/07/2025	21:42	21:42	22:42	23:45

Table 4: Nighttime Bat Walkover Conditions

Survey Date	Start Temp	Wind Beaufort Scale	Rain	Cloud Cover (%)
10/10/2024	9	0	Dry	10
16/04/2025	18	2	Dry	80
03/07/2025	18	1	Dry	5

Survey Constraints

- 3.19 During the 2024 September survey, the static bat detectors at Locations 4 and 6 stopped recording after four nights due to equipment error. Ideally, the detectors should have recorded for five consecutive nights, as per the recommendations of the latest Bat Survey Guidelines. However, in this instance, the detector error is not considered a constraint as relative bat activity is calculated from the average number of registrations per hour. Furthermore the two nights missed account for 1.1% of a cumulative 1900 hours of survey data recorded, which is not considered significant.
- 3.20 The July static bat detector at Location 6 was redeployed between 08/07/25 and 13/07/25, due to failure of the microphone. This is not considered a constraint as deployments were within a similar time frame and in the required month, and weather conditions were similar.
- 3.21 The surveyor position B during the flightline survey was moved from position B to position C for the final survey in summer 2025 due to H & S concerns. This is not considered to be a significant constraint as similar flightlines were able to be sampled from the new position.

4.0 RESULTS

Desk Study

4.1 The desk study returned records for at least eight bat species within 2km:

- Common pipistrelle *Pipistrellus pipistrellus*
- Soprano pipistrelle *Pipistrellus pymaeus*
- Nathusius' pipistrelle *Pipistrellus nathusii*
- Whiskered / Brandt's bat *Myotis mystacinus* / *brandtii*
- Natterer's bat *Myotis nattereri*
- Daubenton's bat *Myotis daubentonii*
- Brown long-eared bat *Plecotus auritus*
- Noctule *Nyctalus noctula*

4.2 A large proportion of the records are within Knowsley Park, located over 1km to the southeast, where over 20 surveys were undertaken between 2011 and 2016. The surveys identified all the species listed above in the park, and the records include both in flight and roost records.

4.3 Nine records refer to the estate buildings, approximately 100m outside the northeast boundary. These include two records whose grid reference falls within the Site boundary, but the record description refers to the offsite buildings. Most notably, brown long-eared bat and common pipistrelle maternity roosts have been recorded here in the past.

4.4 Magic maps showed one granted bat mitigation licence within 2km of the Site. The licence (ref: 2018-38343-EPS-MIT) permitted the destruction of a common pipistrelle resting place between 2019 and 2022, at a location 1.77km to the southeast of the Site.

Habitats

4.5 The majority of the Site comprises fields of species-poor modified grassland managed for silage. There is a field to the west of the Site sown with arable crops and a field to the south that has been left fallow, with some areas of scattered scrub beginning to develop. The modified grassland and fallow field will provide some moderate quality foraging habitat for bat species that hunt in open environments, such as *Nyctalus* spp.

4.6 There are two areas of lowland mixed deciduous woodland in the centre of the Site: Howard's Pit (W2) to the east, and Knowles Pit to the west (W1). Howard's Pit has a canopy abundant in sycamore with frequent oak, an understorey dominated by rhododendron and two shallow, turbid ponds. Knowles Pit also has a canopy abundant in sycamore, with pedunculate oak and crack willow as locally frequent associates. It has an established understorey and three permanent ponds within.

4.7 W1 and W2 are connected by a band of scrub. Both have an area of approximately 1.25ha and provide moderate quality foraging habitat for bat species that feed in cluttered and edge habitats. The ponds in particular will likely increase insect numbers in the woodlands for bats to hunt. The woodlands likely contain trees with suitable roosting features for bats.

4.8 Hedgerows H4 and H5 provide linear commuting routes from the urban areas outside the northern Site boundary towards W1 and W2. Hedgerow H3 connects the woodland habitat on Site to the extended woodland and open water in Knowsley Park to the southeast. Bats may use these features to commute into and through the Site into the wider landscape.

4.9 Given the variety and extent of habitat types on Site, and connectivity to high quality habitats in the wider landscape, the overall Habitat Quality has been assessed as Moderate to High.

Bat Roosting Habitat

4.10 Most trees are retained and buffered within proposals. The ground-based assessment identified no potential roost features within trees anticipated to be impacted by proposals; all were considered to provide negligible suitable roost features. Direct impacts to roosting bats are therefore considered unlikely.

Bat Activity Surveys

Static Monitoring

4.11 The following paragraphs detail the findings of the automated activity surveys. In this context, the term 'registration' refers to a unique sound file created over the course of a number of seconds. Based on this, numerous 'registrations' does not necessarily refer to multiple bats (unlike the transect activity survey section above where the number of bats can often be visually identified), as one bat can create a number of registrations, for example a bat which is foraging in the area surrounding the microphone for a sustained period of time.

4.12 During each survey period, six static detectors were deployed on Site for five nights (unless otherwise stated in the Constraints). The static detector positions were as follows:

- Location 1 – woodland W3, scrub and urban edge at the northeast of Site
- Location 2 – along hedgerow H5, with grassland either side
- Location 3 – on the southern edge of woodland W2, scrub and rank grassland
- Location 4 – within woodland W2, next to pond P4
- Location 5 – along hedgerow H7, with arable field and grassland either side
- Location 6 – within hedgerow H2, along urban edge and arable field

4.13 The same locations, presented in Figure 7.5.4, were used for each month of the static surveys.

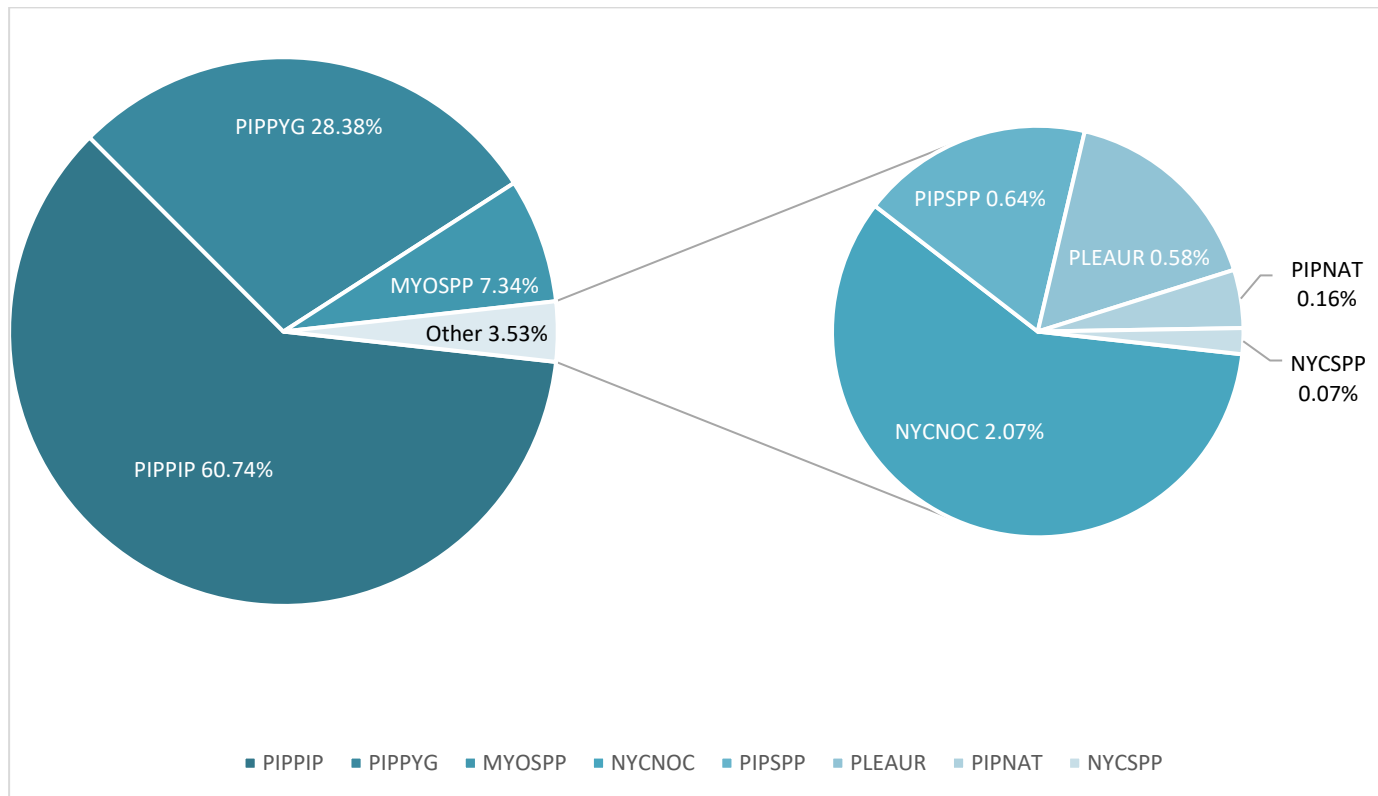
Species Overview

4.14 During statics surveys in the months September – October 2024 and April – July 2025, at least six species were recorded on Site. As bats in the *Myotis* genus are grouped together during analysis of sound recordings, it is possible that more than six species are using the Site. The species and genus groups (where analysis to species level was not feasible) are listed in Table 5, showing the percentage of the total registrations recorded for each.

4.15 As illustrated in Figure 7.5.1, common pipistrelle formed a (61%) majority of the registrations on Site across all surveys, and soprano pipistrelle accounted for a quarter of the total. These two species were recorded by every static in every month of survey. They are the two most common species in the UK and are widespread in all geographies.

- 4.16 *Myotis* species represented nearly 8% of the total registrations, and show consistent use of the Site, with some peaks of activity around autumn.
- 4.17 Noctule and brown long-eared bat made up a smaller proportion of the overall recordings, approximately 2% and 0.58% respectively. The registrations from these species are recorded in every month of the surveys and at each static location, as shown in Table 5, indicating low-level, regular use of the Site. Brown long-eared bat echolocation is relatively quiet, and therefore their calls are less readily picked up by static detector microphones, which may account in part for the low proportion of registrations for this species.
- 4.18 *Nathusius'* pipistrelle were registered sporadically during the surveys, accounting for 0.16% of all recordings. This likely represents occasional passes through the Site by this species, indicating that this is not an important resource for *Nathusius'* pipistrelle.

Figure 7.5.1 : Overall species composition recorded during static bat surveys



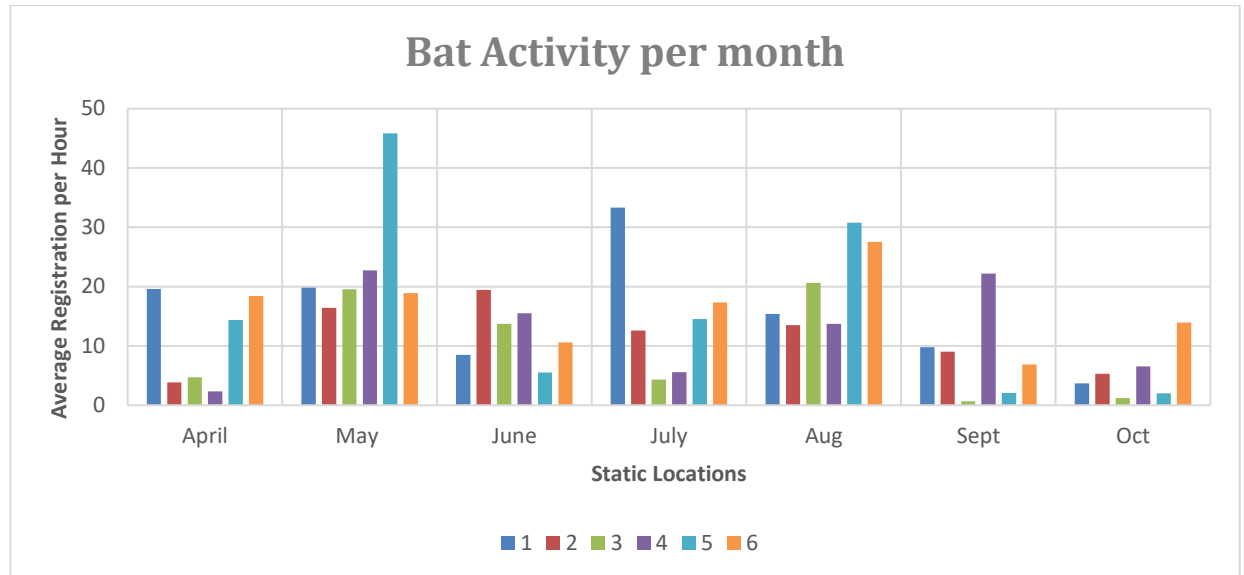
Key: Pippip = common pipistrelle; Pippyg = soprano pipistrelle; Pipnat = *Nathusius'* pipistrelle; Pipspp = *Pipistrellus* species; Myospp = *Myotis* species; Pleaur = brown long-eared bat; Nycnoc = noctule; Nycspp = *Nyctalus* species

General Activity Trends

- 4.19 Relative bat activity by static location is illustrated in Figure 7.5.2.
- 4.20 The highest level of activity was recorded in May at static Location 5, where 45 registrations were recorded per hour on average. Bat activity increased at all locations between April and May, which is expected as this is the time of year when bats become fully active after the colder months, and are preparing to form maternity roosts.

- 4.21 Registrations per hour were mostly between 5 and 20 for all locations between June and July, with Location 1 showing a slightly higher relative activity of 33 per hour in July.
- 4.22 Four of the six static locations show a drop in bat activity between September and October, however activity doubled from approximately 7 to 14 registrations per hour at Location 6.

Figure 7.5.2 : Bat activity recorded per month by static location



Bat Activity by Static Location

Location 1

- 4.23 Soprano pipistrelle was the most frequently recorded species during every month at this location, peaking at an activity level of 26 registrations per hour in July. Bat activity was higher in the spring and summer here, with registrations dropping in the autumn.

Location 2

- 4.24 Common pipistrelle was the most commonly recorded species during every survey month at Location 2, with the highest activity levels recorded in June (17/hour).
- 4.25 This location shows consistent use by a variety of species, with soprano pipistrelle, *Myotis* spp., brown long-eared bat and noctule also recorded during each survey month.

Location 3

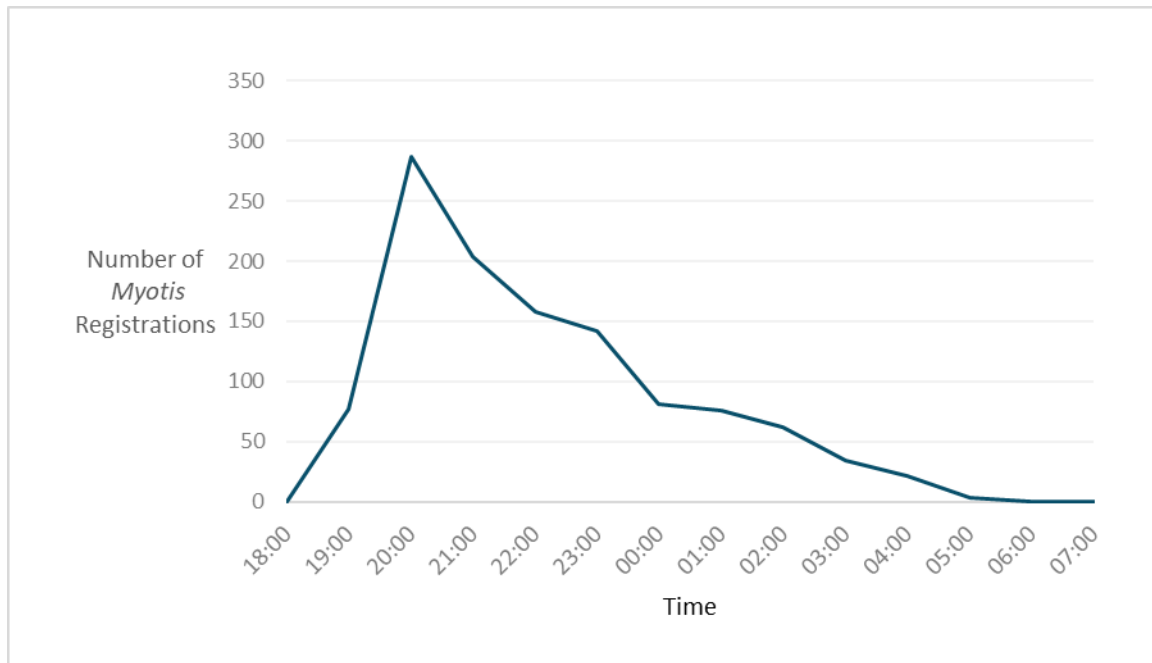
- 4.26 Compared to the other static positions, Location 3 recorded the lowest relative bat activity, with an average of 6.5 registrations per hour throughout the survey months. Common pipistrelle was the most frequently recorded species during each month at this location.

Location 4

- 4.27 Common pipistrelle and soprano pipistrelle were recorded at this location in equal measure, showing similar, generally low levels of activity each month.
- 4.28 There was a sharp peak in *Myotis* spp. activity at Location 4 in September, with an average of 21 registrations per hour. Most of this activity was recorded on the evenings of 27th and 28th

September. Sonobat analysis indicates that the majority of registrations may be Daubenton's bats. Many of the sound files contained feeding buzzes, indicating a continuous foraging behaviour during these two nights. Figure 7.5.3 shows the times of *Myotis* registrations at Location 4 during September. The trend shows a peak in activity 1-2 hours after sunset, and a decline throughout the rest of the night, indicating use of this area by *Myotis* during and just after emergence time.

Figure 7.5.3: Times of *Myotis* Spp. Registrations at static Location 4 during September survey



Location 5

- 4.29 Activity reached the highest levels of any single static here in May, where 45 registrations were recorded per hour on average, with a majority of 38 per hour attributable to common pipistrelle. Otherwise, activity levels here were comparatively low during other months.

Location 6

- 4.30 Bat activity levels at Location 6 on the urban edge habitat remained fairly consistent throughout the survey months, with values between 6 and 19 registrations per hour. April and May saw the highest numbers of recordings, averaging over 18 registrations per hour. Common pipistrelle were the mostly frequently registered species here by a large margin.

Table 5: Species composition recorded during static bat surveys

Static Location	Month	Bat registrations recorded per hour, by species								
		Pippip	Pippyg	Pipnat	Pipspp	Myospp	Pleaur	Nycnoc	Nycspp	Total
1	April	6.542	12.803	0.019	0.112			0.112		19.588
	May	9.573	9.808	0.021	0.257	0.043	0.021	0.107		19.830
	June	3.122	5.113		0.049		0.049	0.172		8.506
	July	6.677	26.170			0.024	0.122	0.341		33.334
	Aug	8.881	5.111		0.021	0.587	0.293	0.461	0.063	15.417
	Sept	2.130	7.365		0.180	0.045	0.045			9.764
	Oct	1.522	2.119				0.014	0.041		3.695
2	April	2.849	0.525			0.112	0.150	0.206		3.843
	May	9.530	5.118	0.064	0.364	0.535	0.364	0.450		16.425
	June	17.601	1.278			0.074	0.098	0.393		19.445
	July	9.259	2.071		0.024	0.244	0.268	0.634	0.073	12.573
	Aug	10.138	2.786			0.105		0.440		13.469
	Sept	8.024	0.390	0.015		0.495	0.075	0.015		9.014
	Oct	4.375	0.326			0.557	0.041	0.027		5.326
3	April	3.524	0.787	0.019	0.112	0.075	0.150	0.019	0.019	4.705
	May	14.648	2.655		0.107	0.171	0.407	1.585		19.573
	June	11.505	1.844	0.025		0.147		0.123	0.074	13.717
	July	1.998	1.462			0.585		0.244	0.024	4.313
	Aug	17.344	2.472			0.126	0.021	0.607	0.042	20.612
	Sept	0.390	0.030			0.210		0.015		0.645
	Oct	0.679	0.258			0.245	0.014			1.196
4	April	1.181	1.068		0.019	0.037	0.019			2.324
	May	10.772	9.765	0.064	0.428	0.021		1.649	0.043	22.743
	June	7.522	7.547			0.369		0.049		15.487
	July	3.874	1.121			0.219	0.024	0.317		5.556
	Aug	1.718	6.326			4.985	0.545	0.105	0.021	13.700
	Sept	0.301	0.320		0.056	21.543				22.219
	Oct	1.263	0.815			4.456				6.535
5	April	10.534	3.412		0.319	0.019	0.037	0.056	0.019	14.396
	May	38.247	6.168	0.257	0.685	0.021	0.064	0.385		45.828
	June	4.843	0.147		0.049		0.025	0.393	0.049	5.506
	July	11.769	1.754			0.414	0.049	0.536	0.024	14.547
	Aug	6.326	23.732			0.335	0.042	0.335		30.770
	Sept	1.260	0.585		0.045	0.135		0.030		2.055
	Oct	1.630	0.353		0.014	0.014	0.014	0.014		2.038
6	April	17.076	0.862	0.131	0.150			0.225		18.445
	May	16.939	0.685	0.257	0.557	0.021		0.450		18.909
	June	9.710	0.418	0.074				0.369		10.570
	July	14.174	2.366		0.072	0.120	0.048	0.574		17.353
	Aug	19.899	5.781		0.021	0.356	0.377	1.089		27.523
	Sept	6.297	0.545					0.038		6.880
	Oct	12.934	1.005			0.014		0.014		13.966

Key: Pippip = common pipistrelle; Pippyg = soprano pipistrelle; Pipnoat = Nathusius' pipistrelle; Pipspp = *Pipistrellus* species; Myospp = *Myotis* species; Pleaur = brown long-eared bat; Nycnoc = noctule; Nycspp = *Nyctalus* species

Night-time Bat Walkovers

Flightlines Survey

- 4.31 The results of each survey are summarised in the following paragraphs. During each survey the surveyors were positioned at the following points (see Figure 7.5.5):
- A – at the hedgerow on the northwest corner of W1 (autumn, spring, summer surveys)
 - B – at the eastern point of H2, joining H5 along the urban edge (autumn, spring surveys)
 - C – along the northern edge of W2 (Surveyor moved for H&S reasons during the summer survey)

Autumn

- 4.32 The autumn flightlines survey took place on 10th October 2024. Activity was generally low at both observation locations. At point A, one common pipistrelle was observed commuting along the western edge of W1 during the survey. At location B, a common pipistrelle and a soprano pipistrelle were heard commuting but not observed.

Spring

- 4.33 The spring survey took place on 16th April 2025. At observation location A, fairly continuous bat commuting activity was heard from common pipistrelle and noctule, likely from within the woodland to the south. Two common pipistrelle were observed flying in tandem from north to south along the western woodland edge, and a further five common pipistrelle were seen commuting and foraging along the same route 20 minutes later.
- 4.34 At observation point B, common pipistrelle were the most frequently heard species, with occasional passes from noctule and soprano pipistrelle. A single commuting brown long-eared bat was observed flying along the hedgerow from the north in a southerly direction towards to the woodlands. Bats were observed commuting along H5 in both directions and also along H3 flying eastwards.

Summer

- 4.35 The summer survey was undertaken on 3rd July 2025. At observation point A, two soprano pipistrelle were observed commuting along H7 in a southerly direction, from the urban area towards woodland W1. Throughout the remainder of the flightlines observation, common pipistrelle were observed foraging along the woodland edge at the north of W1.
- 4.36 No bat activity was noted at observation location C during the summer flightlines survey.

Walked Transect

- 4.37 The autumn transect followed directly after the flightlines observation, and during the survey, a single *Myotis* spp. bat was observed commuting along the northwest edge of W2.
- 4.38 During the spring transect, one noctule was heard at the beginning of the survey, and following that, all other recordings were common pipistrelle. Consistent foraging by up to five bats was observed along the eastern boundary of the Site, and social calls were heard at the southeast corner. Sporadic commuting activity was also heard along H1, H2, H7, W1 and W3.

- 4.39 During the summer transect, common pipistrelle and soprano pipistrelle were noted foraging along woodland edge habitat of W1. Sporadic commuting and foraging contacts with these species were also noted along the urban edge habitat to the north. Two commuting noctule passes were heard during the survey but not seen.

5.0 DISCUSSION

Bat Roosting

- 5.1 Most trees are retained and buffered within proposals. The ground-based assessment identified no potential roost features within trees likely to be impacted by proposals; all were considered to provide negligible suitable roost features. Direct impacts to roosting bats are therefore considered unlikely.
- 5.2 Indirect impacts to potential roosts within the woodlands may be caused by fragmentation of the habitat in the new Site layout, and noise and light disturbance during the construction and operational phases of the proposed development. All of the bat species recorded on Site are known to roost in trees and therefore avoidance measures should assume presence of these species roosting in W1, W2 and W3 and other trees on Site.

Bat Activity

Species Diversity

- 5.3 The species assemblage recorded on Site is typical for the north of England and for the grassland, agricultural and woodland habitat on Site. The species diversity of the bats shown to be using the Site consistently is moderate for the area with at least six species recorded (multiple species of the genus *Myotis* may be present.) The Site supports common and widespread species with sporadic passes of rarer bats.
- 5.4 The most recorded species on Site was common pipistrelle by a significant margin, accounting for 61% of the total bat registrations during the static surveys. This was also the most abundant species on transect and flightlines surveys, where they were observed foraging and commuting. Common pipistrelle are the most common bat species in the UK and are widespread in all geographies.
- 5.5 Consistent use of the Site by soprano pipistrelle, *Myotis* Spp, brown long-eared bat and noctule was also recorded. These species represented a smaller proportion of the total registrations but were recorded at all locations and during each month of the static surveys, as well as being heard and observed during the nighttime bat walkovers.
- 5.6 Occasional passes by Nathusius' pipistrelle were recorded during the static surveys. The infrequency of registrations likely represents intermittent passes by solitary bats and significant use of the Site by this species has been ruled out. Nathusius' pipistrelle are considered rare in the UK but have long been deemed under-reported.

Habitat Use and Impacts

- 5.7 The highest overall bat activity recorded during the static surveys – with an average of just under 16 registrations per hour – was at Location 1, sampling woodland, scrub, and urban edge habitat around W3 to the far northeast of the Site. However, this is still considered a generally low level of activity, with periods of moderate activity in the spring and summer. Soprano

pipistrelle accounted for the majority of registrations during every month of recording at this location, in contrast with a common pipistrelle majority at all other static recording locations. This may indicate the presence of a soprano pipistrelle roost offsite nearby. The proposals retain W3 within the Site layout so this habitat will not be lost. Although soprano pipistrelle are generally not as light averse as other bat species, the lighting design should direct light away from the woodland and scrub to avoid any potential impacts to bats foraging or commuting in this area.

- 5.8 A fairly consistent, low level of foraging and commuting behaviour was recorded along the edges of woodland W1 throughout the survey months. The peak of *Myotis* activity in September at static Location 4 within W1 was likely a brief intensification of Daubenton's bats foraging over the waterbodies in the woodland over a period of two days. A swarming event has been ruled out for several reasons: i) the bat call analysis found many feeding buzzes in the data during at this location, indicating continuous foraging; ii) the registrations were mostly recorded at the start of the night, within the time when bats are emerging and starting to forage, and they did not continue at the same level throughout the night as would be expected with swarming behaviour; and iii) typically, swarming behaviour is observed near to hibernation Sites, which for Daubenton's bats are characteristically caves or other underground structures, which are not present within W1 or anywhere else on Site.
- 5.9 Nevertheless, W1 clearly provides a valuable foraging resource for bats, as recorded during static surveys and observed (particularly common pipistrelle and soprano pipistrelle) along the woodland edge habitats during flightlines and transect surveys.
- 5.10 Connectivity to the wider landscape will be maintained in the landscape proposals from W1, along W2 and out of the southeast corner of the Site by H6. The Biodiversity Net Gain (BNG) Report (FPCR, 2025) proposes an improvement the condition of W1 from poor to moderate. Changes such as thinning to create clearings will likely improve the quality of the foraging habitat for bats by creating more open habitats for feeding. A buffer of mixed scrub and neutral grassland around W1 and W2 will reduce noise impacts on this habitat, while providing more open spaces for larger species of bats to feed. Lighting will be avoided in this area, where possible, to maintain its value to foraging and commuting bats.
- 5.11 Woodland W2 had the lowest overall activity recorded during the static surveys, however only a small area was sampled, and the woodland may be used by bats to a greater extent in other parts. Similar to the proposals for W1, the BNG Report proposes an improvement in the condition of W2 from poor to moderate, which will likely in-turn improve the quality of foraging resource available for bats in this woodland.
- 5.12 Hedgerow habitats on Site all support a generally low level of commuting activity, with some higher levels of commuting and foraging activity along H2 and H5 observed during flightlines and recorded on static detectors. No significant commuting corridors were identified during the surveys. Hedgerows on Site are largely retained within the proposed scheme, with gaps planned to facilitate roads through H3, H5, H6 and H7. Connectivity along these commuting routes will be re-established by allowing tree canopies to grow over the roads, creating a continuous feature for bats to navigate by. Furthermore, the lighting scheme will detail requirements to leave these corridors unlit in the operational phase of the development, so as not to impact especially light-averse species such as brown long-eared bat and *Myotis* Spp.

- 5.13 The open grassland and arable field habitats on Site were not observed being used by foraging bats to any significant extent during the flightlines or transect surveys. Therefore, their loss and reduction in size to facilitate the proposed development is anticipated to have a negligible impact on foraging bats. Higher quality foraging habitats both within the woodlands on Site and in adjacent offsite habitats likely support feeding bats in the area.

Conclusions

- 5.14 The key habitats for bats are largely retained within the proposals and buffered by green space. Furthermore, the condition of the woodlands and hedgerows will be improved as per the BNG report, and lighting design will aim to avoid impacts on foraging and commuting bats by light pollution.
- 5.15 There may be a temporary impact on the commuting habitat along H3, H5, H6 and H7 due to gaps created for roads. However this will hopefully be reinstated over time by the growth of tree canopies over the gaps.
- 5.16 Overall, the impacts on foraging and commuting bats as a result of the proposed development are likely to be a minor negative impact at Site level in the short term, with scope for a minor positive impact at Site level in the longer term.

6.0 MITIGATION & RECOMMENDATIONS

- 6.1 Measures to prevent pollution and damage to retained habitats, particularly woodlands and hedgerows, during construction should include protective fencing, a sensitive lighting scheme and root protection.
- 6.2 The lighting scheme for the Site will be designed to minimise light-spill onto habitats both within and adjacent to it that are suitable for bat foraging and/or commuting. It is recommended that the lighting design strategy is reviewed (and if necessary updated) for any new development proposals as part of future Reserved Matters applications, to ensure that any impacts to wildlife from lighting are minimised. Lighting strategies should follow the best practice guidance¹ as set out below:
- the avoidance of direct lighting of woodland edge, scrub and retained trees or proposed areas of habitat creation / landscape planting;
 - LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
 - a warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce the blue light component;
 - light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
 - column heights should be carefully considered to minimise light spill and glare visibility; and

¹ <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/>

- lighting levels should be as low as guidelines permit and only used where required for public safety.

7.0 GENERAL ENHANCEMENTS

- 7.1 To provide additional biodiversity enhancement, as encouraged in the NPPF, bat boxes should be installed across the Site. A total of 10 bat boxes, 5% of the number of housing units proposed, across the Site is recommended.

FIGURES

FPCR Environment and Design Ltd

Registered Office: Lockington Hall, Lockington, Derby DE74 2RH
Company No. 07128076. [T] 01509 672772 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

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- Site Boundary
- Static Bat Detector Location (with reference)

date
07/08/25

drwn/chkd
DV / MS

client
Hallam Land Management Ltd

project
**Land east of Knowsley Lane,
Knowsley**

title
**STATIC BAT DETECTOR
LOCATION PLAN**

scale
1:3,000 @ A3

number
FIGURE 7.5.4

rev
-

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0 25 50 m

Site Boundary

Surveyor Locations
(with reference)

Bat Contacts

Spring

Autumn

Summer

Flight Paths

Commuting

Species

Paur Brown long-eared Nnoc Noctule

Ppi Common pipistrelle Ppy Soprano pipistrelle

date
09/10/25

drwn/chkd
DV / MS

client
Hallam Land Management Ltd
project
**Land east of Knowsley Lane,
Knowsley**

title
**BAT FLIGHT LINE SURVEY
RESULTS PLAN**

scale
1:3,000 @ A3

number

rev

FIGURE 7.5.5

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Site Boundary

Transect Route

Start and Finish Points

Spring

Summer

Autumn

Bat Contacts

Spring

Summer

Autumn

Flight Paths

Species

Ppi Common pipistrelle

Nnoc Noctule

Ppy Soprano pipistrelle

Msp Myotis sp.

date
07/08/25

client
Hallam Land Management Ltd

project
Land east of Knowsley Lane,
Knowsley

title
BAT TRANSECT SURVEY RESULTS
PLAN

scale
1:3,000 @ A3

number

FIGURE 7.5.6

rev

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