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Appendix 10C: Bat Surveys
Keuper Gas Storage Project

ISSUE RECORD

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Checked by	Jenny Hills Principal Ecologist
Approved by	Charlotte Haylock Senior Ecologist

The information and advice contained in this report has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

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1 INTRODUCTION

1.1 Scope of Report

This report has been prepared by Peak Ecology Ltd on behalf of Keuper Gas Storage Limited. It provides a summary of bat (*Chiroptera)* surveys carried out in 2025, associated with the Proposed Development. At the time of writing, not all surveys have been completed; this report provides only the results of surveys carried out to date.

The purpose of this report is to:

- Detail the methodology used to undertake surveys relating to bats; including Ground Level Tree Assessments (GLTAs), transect surveys, deployment of static recording devices and aerial tree assessments;
- Provide survey details, including surveyors, survey conditions and timings and any constraints to the 2025 survey effort; and
- Summarise the findings of the surveys.

This report does not include an evaluation of impacts or detailed mitigation; this will be provided within the EIA.

The approach to this survey and report follows best practice published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2013) and the Biodiversity – Code of Practice for Planning and Development (BSI, 2013). Details of individual survey methods and associated supporting information are provided in Section 2.

1.2 Study Area

The geographical extent of the potential impact of a proposed development is known as the Zone of Influence (ZOI). The ZOI is determined by the nature of the development, the habitat requirements and mobility of individual species relevant to the site, and the distances they typically cover as indicated in best practice guidelines. In relation to bats the ZOI is considered to be the Site.

1.3 Planning Context and Legislation

All British bat species are European Protected Species (EPS) under the Conservation of Habitats and Species Regulations 2017 (as amended). They are also listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); protected by Parts 4(b), 4(c) and 5 of Section 9 of the Act. In net effect, it is an offence to:

- Deliberately capture, injure or kill bats;
- Intentionally or recklessly disturb bats in a place of shelter (roost);
- Intentionally or recklessly damage, destroy or obscure access to a breeding site or resting place (roost); and/ or
- Possess, control, transport, sell or exchange a bat or any part of a bat, unless acquired legally.

As bats use roosts at different times of year and typically return to the same roosts annually, it is a legal opinion that a roost is protected whether bats are in occupancy at the time or not.

The presence of an EPS, such as bats, is a material planning consideration; therefore, the LPA have a duty to assess whether a development proposal is in breach of the legislation by the application of the three Habitats Directive tests, as implemented by the Habitats Regulations. Sufficient information must be provided detailing likely impacts to the species in question as a result of the proposals, as well as any necessary mitigation or compensation measures. The test relevant to this report is that which relates to the Favourable Conservation Status of the species.

2 METHODOLOGY

2.1 Desk Study

A desk-based review of bat records obtained from RECORD, Cheshire Environmental Record Centre) was completed in February 2025. In addition, the Multi-Agency Geographic Information for the Countryside (MAGIC) website was accessed to identify any records of bat licence returns within the Study Area. The desk study has been reported in a standalone document (Appendix 10A) but information relevant to bats has been included in this report.

2.2 Ground Level Tree Assessment (GLTA)

The trees on Site were assessed from ground level using binoculars and high-powered torches, where necessary, to identify potential roost features (PRF's). Each PRF was photographed and described in terms of its location, height, orientation and potential suitability for roosting bats. Features that may be utilised by roosting bats include woodpecker holes, knot holes, cracks, lifted bark and dense ivy coverage.

2.2.1 *Assessment Criteria for Roosting Habitat - Trees*

Each tree was initially assigned an overall suitability category based on the presence, or likely presence, of PRFs, as per Table 1 below.

Table 1: Guidelines for assessing roosting suitability of trees (Collins (ed), 2023)

Potential Suitability	Description
NONE	No PRFs present or presence of PRFs highly unlikely.
FAR	Further assessment required (e.g. aerial assessment) to establish if PRFs are present.
PRF	At least one PRF present within tree.

Where PRFs were visible from the ground, their locations and characteristics were recorded to determine the requirement for and nature of further surveys. Features were categorised according to their size, condition and suitability of surrounding habitats. **PRF-I** was applied to features suitable for individual or small numbers of bats, and **PRF-M** was applied to features suitable for multiple bats or roosts of higher conservation significance such as maternity roosts.

2.3 Night-Time Walkover Surveys

Three transect routes were designed for the walkover surveys to ensure maximum coverage of the Site; each targeting key areas of potential impact by the Proposed and Consented Development, and any areas providing suitable foraging and commuting habitat for bats.

Survey methods follow the industry standard, outlined by the Bat Conservation Trust (Collins (ed), 2023). Each survey involves a pair of surveyors walking a pre-determined route, equipped with hand-held heterodyne bat detectors and Titley Scientific Anabat Swift or Anabat Chorus detectors to record and GPS-tag any detected bat calls. Surveyors also record details

of observations during the survey including bat flight lines, number of individual bats and their behaviour.

Surveys last for approximately 2.5 hours, with each transect route being approximately 4km. The transects are walked at a fairly constant pace with stopping points periodically. The routes are reversed part-way through the suite of survey visits, in order to sample different habitats at different times and to overcome the limitation of light loss over the course of the survey, which can result in a reduction in visibility of bats for the surveyors.

Transect surveys are undertaken at dusk, with the surveys commencing at, or close to, sunset. Survey timings and weather conditions are noted on each survey visit. Surveys are scheduled to avoid unsuitable weather conditions, such as strong wind or rain, and poor visibility.

An overview of all transect routes is presented within Section 3.2 of this Appendix.

2.3.1 *Survey Timings and Conditions*

The surveys started in May and will be completed by the end of September 2025. Dates of each survey are presented in Table 2, below, with information regarding transect survey conditions in Table 3.

Table 2: Night-time walkover survey dates

No.	Survey Dates		
	May	July	September (TBC)
T1	15/05/25	28/07/25	17/09/25
T2	19/05/23	28/07/25	17/09/25
T3	20/05/25	28/07/25	17/09/25

Table 3: Night-time walkover survey conditions

Visit No.	Survey Date	Start Time	End Time	Weather Conditions					
					Cloud Cover	Wind (BF)	Temp.	Relative Humidity	Rain
1 (T1)	15/05/25	21:03	23:30	Start: End:	0 0	2 NW 2 ENE	13°C 9°C	64% 82%	No
1 (T2)	19/05/25	21:00	00:00	Start: End:	1 2	2 NE 2 NE	13°C 11°C	78% 84%	No
1 (T3)	20/05/25	21:10	23:12	Start: End:	3 2	1 SE 1 SE	17°C 13°C	76% 82%	No
2 (T1)	28/07/25	21:05	23:30	Start: End:	1 1	1 NW 1 SE	16°C 14°C	71% 84%	No
2 (T2)	28/07/25	21:05	23:30	Start: End:	1 1	1 NW 1 SE	16°C 14°C	71% 84%	No
2 (T3)	28/07/25	21:39	23:15	Start: End:	1 1	1 NW 1 SE	16°C 14°C	71% 84%	No

2.4 Static Monitoring Surveys

Six full spectrum Anabat Chorus devices were deployed across the Site, targeting areas of notable habitat close to areas of development. These devices were set to record bat activity from half an hour before sunset, through the night until half an hour after sunrise for five consecutive nights over each month. The detectors were left out continuously and the five consecutive days with the best weather conditions selected for analysis. Plate 1 shows locations of static deployment.

Plate 1: Static locations and detector reference numbers

2.5 Sound Analysis

Recordings from transect and static monitoring surveys are subsequently analysed with Wildlife Acoustics Kaleidoscope Pro bat analysis software. Each data file is run through the software's AutoID function, which assigns a likely species label based on an algorithm measuring characteristics of each call.

For transect surveys these files are manually checked to ensure that the correct species labels were added to each data file. This is then mapped onto the walked transect route using the location data stored within the recordings.

Due to the large volumes of data recorded by the static detectors, only a sample of calls are manually analysed to generate a species list for each detector, per month. This also allows a review of any unusual species flagged by the AutoID, which may have been misidentified.

The AutoID was used to filter out noise files and to group species together such as *Nyctalus* and *Myotis*. This data was then used to generate graphs to provide a high-level illustration of the trends and patterns of bat activity, for each static detector.

2.6 Aerial Assessment

Aerial assessments will be carried out of trees that will be directly impacted by the Proposed Development. At this stage, it is our understanding that removal of trees is limited to those within the GPP area.

Aerial roped techniques will be used to gain closer access to features within trees identified during the GLTA as having potential suitability. Features will be further assessed to confirm their suitability for roosting bats, identifying any evidence of bat presence such as droppings or staining.

The results of this assessment will be processed and reported upon completion of surveys.

2.7 Surveyors

All surveys were led by a suitably experienced and/or licenced bat ecologist, with an assistant to provide health and safety support. All surveyors are appropriately qualified to undertake the relevant surveys based on the CIEEM competency framework (CIEEM, 2021).

Aerial assessments of trees will be carried out by surveyors qualified under CS38 Tree Climbing and Aerial Rescue, led by a licenced bat ecologist.

Details of surveyors are provided below in Table 4.

Table 4: Surveyor details

Surveyor	Bat Licence Registration Number (if applicable)
Helen Staton	2015-14490-CLS-CLS
Jade Bateman	2023-11128-CL17-BAT
Neil Watkin	2020-50099-CLS-CLS
Charlie Flowers	2022-10641-CL17-BAT
Jonathan Brickland	N/A
Charlotte Haylock	N/A
Eve Scott	N/A
Emily Stephenson	N/A
Melissa Emblin-Simpson	N/A
Carrie Alcock	N/A
Helena Coles	N/A

Surveyor	Bat Licence Registration Number (if applicable)
Sabina Schneider	N/A
Libby Norton	N/A
Becky Clarke	N/A
Joe Freer	N/A

2.8 Limitations

2.8.1 *Survey Methods*

Ground Level Tree Assessment (GLTA)

PRFs found are limited to those which can be seen from ground level. Any PRFs high up in the canopy could be missed. Moreover, the suitability of a feature for bats cannot always be accurately estimated from ground level and aerial inspection may be required to confirm suitability of features with limited visibility from the ground.

Static Monitoring and Night-Time Bat Walkover Surveys

Sound analysis of bat calls to species level is not always possible and, in some instances, calls are only identified to genus level. This is particularly the case for the *Myotis* species. For example, it is difficult to distinguish between the echolocation calls of whiskered and Brandt's bats. Where identification to species level has not been possible, calls have been labelled at genus level (i.e. *Myotis* sp).

Each recording of calls from static monitoring reflects the number of bat passes but cannot reflect the number of bats present at the time of recording. Moreover, the Kaleidoscope Pro Auto ID function only assigns one species ID per file and it is possible several will be present on any given file, as such the numbers produced in this report reflect the minimum bat activity.

The Kaleidoscope Pro AutoID function is very useful to allow a fast analysis of a large number of sound files. However, its accuracy for certain species groups cannot be relied upon 100% of the time. As such every batch of files analysed was subjected to a formal verification to assess the species identified. Due to the large number of files generated by static monitoring it was considered disproportionate to assess each file, as such exact number of passes for each species have not been counted for static monitoring.

The use of acoustic static data can be used to find hotspots of activity and is very useful to find important features for bat foraging or commuting; however, it is limited to the location of deployment and range of detection of the equipment used. Moreover, acoustic methods are thought to under record species such as brown long-eared bat *Plecotus auritus* and species of *Myotis* whose calls tend to be quieter and attenuate more quickly in the environment. Brown long-eared bats especially, often do not echolocate at all so are likely to be missed.

Both static monitoring and transect surveys represent a snapshot in time and any activity happening outside these timeframes will ultimately be missed.

3 RESULTS

3.1 Desk Study

There are 84 records of bats within the search area, dominated by common pipistrelles *Pipistrellus pipistrellus* (22 records).

All bats are fully protected at UK and European level by the Wildlife & Countryside Act 1981 and the Conservation of Habitats and Species Regulations 2017. This means that they are protected against disturbance, injury and killing and protection is extended to their roost sites, even when they are not present.

A summary of species recorded is included in Table 5.

Table 5: Bat records returned from the records centre

Common name	Scientific name	Number of records	Record on Site	Roost	Other evidence of presence	No detail provided
Brown long-eared	*Plecotus auritus*	10	✓		✓	
Common pipistrelle	*Pipistrellus pipistrellus*	22	✓	✓		
Daubenton's	*Myotis daubentonii*	4				✓
Noctule	*Nyctalus noctula*	6	✓			
Soprano pipistrelle	*Pipistrellus. pygmaeus*	17	✓	✓	✓	
Whiskered	*Myotis mystacinus*	6	✓		✓	

3.2 Survey Results

3.2.1 *Ground Level Tree Assessment (GLTA) Summary*

Data was gathered for a total of 309 trees across the Site, that were considered to hold some potential for roosting bats. Almost all trees recorded were oak *Quercus* sp., or ash *Fraxinus excelsior,* with many having notable deadwood features, hollow stems, knot holes or snapped limbs. A full dataset for trees on Site will be presented in the final data report.

3.2.2 *Night-time Walkover*

The results for the May surveys are detailed below and displayed on the maps in Figure 1. The data from the July surveys is in the process of being analysed. These will be reported upon completion of the surveys, along with the results of the final visit.

Transect 1 – May

Transect 1 had the highest level of bat activity compared to the other two transect routes with a notable hot spot of activity along the tree-lined footpath to the north. Common pipistrelle, soprano pipistrelle and noctule were noted utilising the tree lines for both commuting and foraging.

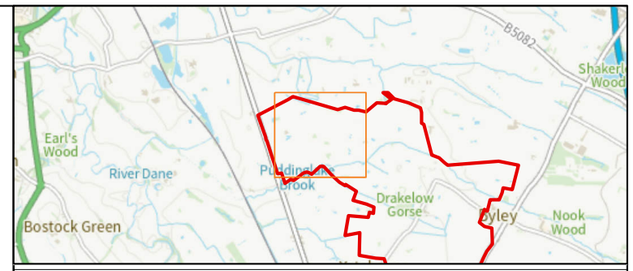
Natterers and brown long-eared bat, as well as an un-identified myotis bat, were also noted during the survey.

Transect 2 – May

The southern end of the transect had higher level of activity along hedgerows in this section. Species found along the length of this transect were mainly limited to common and soprano pipistrelle with one noctule pass noted along a tree line on the northern end of the transect.

Transect 3 – May

The woodland provided a notable hot spot of activity along Transect 3 with common pipistrelle noted foraging round an oak tree. Pipistrelle bats were also noted commuting and foraging along the hedgerows west of this woodland.



Survey Information

Site boundary

Transect route

Bat Transect - Results

- Brown long-eared bat (2)
- Common pipistrelle (17)
- Soprano pipistrelle (26)
- Myotis sp. (1)
- Natterer's bat (3)
- Noctule bat (12)

N

0 25 50 100
Metres

PROJECT TITLE

STORENGY UK - STUBLACH SITE

DRAWING TITLE

Figure 1. Bat Transect Results Transect 1, Visit 1 - May 2025

VER	DATE	REMARKS	Drawn	Checked
1.1	08/08/25	Bat Transects	MP	ES

DRAWING NUMBER:
PeakEcology/StoreEnergyStublach/BatTansectTransect 1

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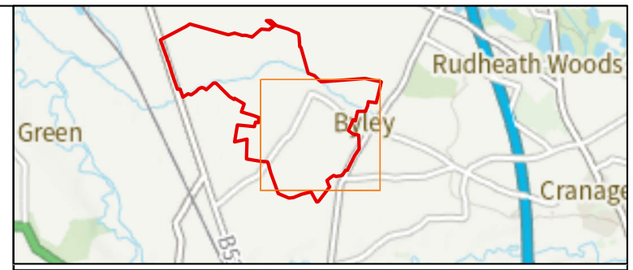
DATUM	OSGB
PROJECTION	BNG
PLOT SIZE	A3
SCALE	1:3,500



Survey Information

Site boundary

Transect route

Bat Transect - Results

- Brown long-eared bat (0)
- Common pipistrelle (16)
- Soprano pipistrelle (13)
- Myotis sp. (1)
- Natterer's bat (0)
- Noctule bat (1)

Source:
Ordnance Survey © Crown copyright 2025, All rights reserved. License Number 100049837.

N

0 25 50 100
Metres

PROJECT TITLE

STORENGY UK - STUBLACH SITE

DRAWING TITLE

Figure 1. Bat Transect Results Transect 2, Visit 1 - May 2025

VER	DATE	REMARKS	Drawn	Checked
1.1	08/08/25	Bat Transects	MP	ES

DRAWING NUMBER:
PeakEcology/StoreEnergyStublach/BatTansectTransect 2

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DATUM	OSGB
PROJECTION	BNG
PLOT SIZE	A3
SCALE	1:5,400

Survey Information

Site boundary

Transect route

Bat Transect - Results

- Brown long-eared bat (0)
- Common pipistrelle (4)
- Soprano pipistrelle (1)
- Myotis sp. (0)
- Natterer's bat (0)
- Noctule bat (0)

N

0 25 50 100
Metres

PROJECT TITLE

STORENGY UK - STUBLACH SITE

DRAWING TITLE

Figure 1. Bat Transect Results Transect 3, Visit 1 - May 2025

VER	DATE	REMARKS	Drawn	Checked
1.1	08/08/25	Bat Transects	MP	ES

DRAWING NUMBER:
PeakEcology/StoreEnergyStublach/BatTansectTransect 3

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DATUM	OSGB
PROJECTION	BNG
PLOT SIZE	A3
SCALE	1:5,500

3.2.3 *Statics: May-June Summary*

Table 6 below shows a summary of the number of recorded passes per species group identified during the AutoID process, for each static detector during May and June. At this stage, a formal verification of species ID has not been undertaken; as such, records have been listed either according to species or genus.

Several recordings have been identified by the AutoID function as barbastelle *Barbastella barbastellus;* this species is very rarely recorded in Cheshire and as such, it is possible these have been incorrectly labelled by the software. Further manual verification of AutoID results will be carried out to confirm any notable species recordings.

Overall, June showed elevated activity compared to May with the exception of Static 4 and Static 5. Static 3 has shown the highest level of activity so far, primarily relating to soprano pipistrelle activity; however, Static 4 shows the highest level of activity for both *Nyctalus* and *Myotis* species.

Table 6: Summary of bat passes during static monitoring in May and June

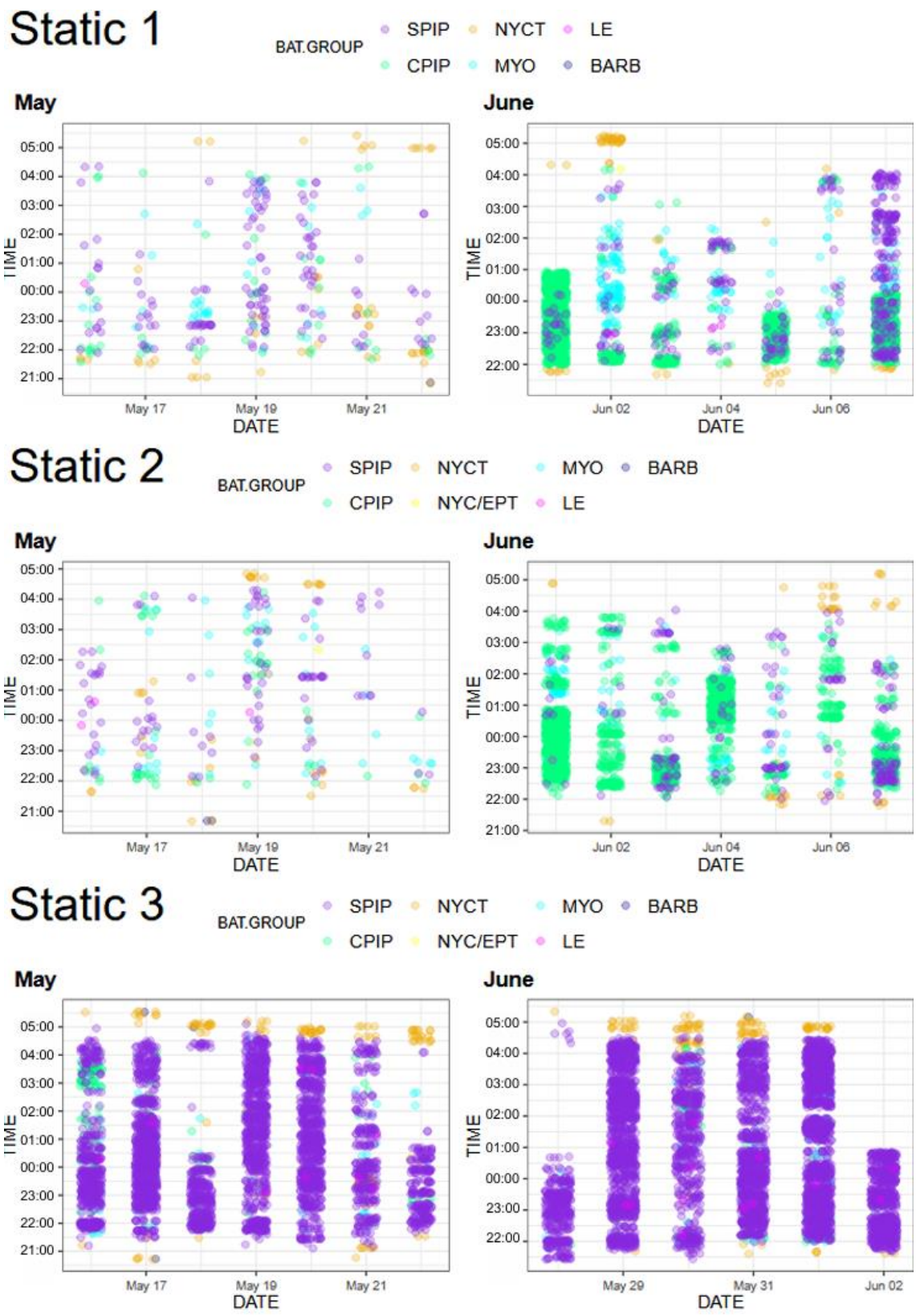
Static	Species	May	June
1	*Nyctalus* sp.	55	71
	Myotis sp.	38	211
	Common pipistrelle	56	1804
	Soprano pipistrelle	149	402
	Pipistrellus sp.	0	0
	Plecotus sp.	1	3
	Barbastelle	1	0
	Total	**300**	**2491**
2	*Nyctalus* sp.	40	47
	Myotis sp.	45	122
	Common pipistrelle	56	2007
	Soprano pipistrelle	108	219
	Pipistrellus sp.	3	16
	Plecotus sp.	4	1
	Barbastelle	2	0
	Total	**258**	**2412**
3	*Nyctalus* sp.	139	123
	Myotis sp.	73	113
	Common pipistrelle	143	55
	Soprano pipistrelle	3799	5241
	Pipistrellus sp.	1	0
	Plecotus sp.	9	14
	Barbastelle	6	1
	Total	**4170**	**5547**
4	*Nyctalus* sp.	965	70
	Myotis sp.	272	507

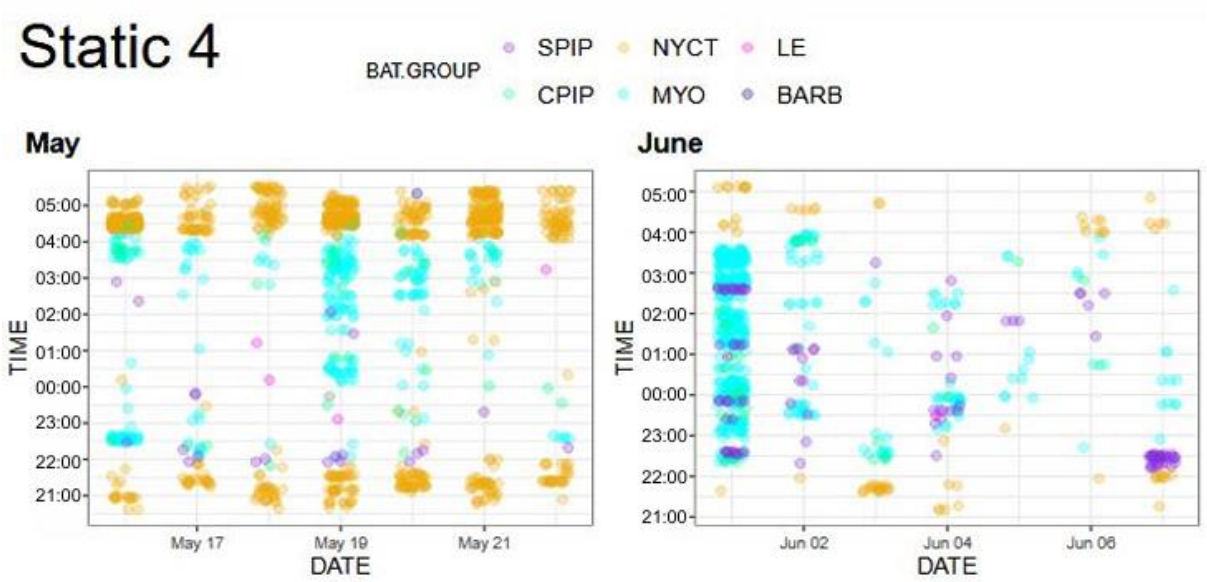
	Common pipistrelle	32	104
	Soprano pipistrelle	21	32
	Pipistrellus sp.	1	0
	Plecotus sp.	4	1
	Barbastelle	1	0
	Total	**1296**	**714**
5	*Nyctalus* sp.	63	81
	Myotis sp.	156	13
	Common pipistrelle	19	9
	Soprano pipistrelle	3507	694
	Pipistrellus sp.	1	0
	Plecotus sp.	2	4
	Barbastelle	2	0
	Total	**3750**	**801**
6	*Nyctalus* sp.	408	74
	Myotis sp.	122	24
	Common pipistrelle	689	2461
	Soprano pipistrelle	224	502
	Pipistrellus sp.	2	0
	Plecotus sp.	19	6
	Barbastelle	15	0
	Total	**1479**	**3067**

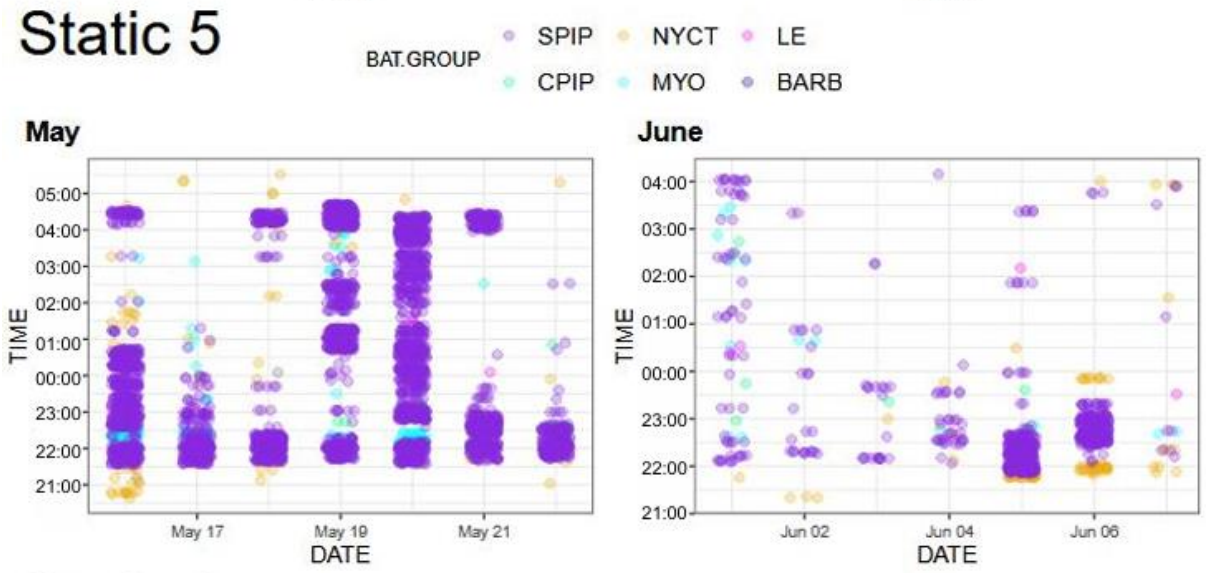
Figure 2 below shows the summary of activity throughout the night for each static across the survey windows for May and June.

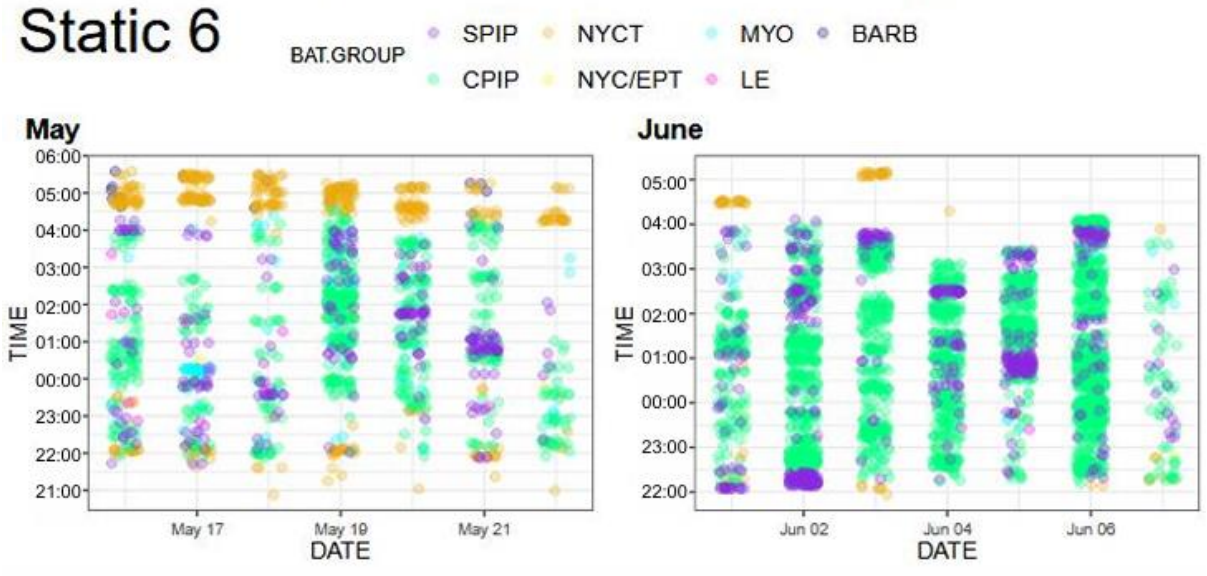
Static four shows clusters around dusk and dawn for *Nyctalus* species in both May and June this could indicate roosting nearby for this species with a valuable commuting route past this static location. Static 3 shows a similar pattern but to a lesser degree, which likely corresponds to the same activity shown in static four. Other statics generally show elevated activity through the night more consistent with foraging.

Figure 2: Graphs showing bat activity throughout the night across the static monitoring period




Static 4
BAT.GROUP
SPIP
NYCT
LE
CPIP
MYO
BARB
May
June
TIME
DATE
May 17
May 19
May 21
Jun 02
Jun 04
Jun 06


Static 5
BAT.GROUP
SPIP
NYCT
LE
CPIP
MYO
BARB
May
June
TIME
DATE
May 17
May 19
May 21
Jun 02
Jun 04
Jun 06


Static 6
BAT.GROUP
SPIP
NYCT
MYO
BARB
CPIP
NYC/EPT
LE
May
June
TIME
DATE
May 17
May 19
May 21
Jun 02
Jun 04
Jun 06

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