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Bat roost surveys for new prison on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire

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1	18/08/2021	n/a
2	23/08/2021	Clarifications, minor edits.
3	27/08/2021	Change Raven refs in appendix to Gartree 2. Wording change re sheep farm.

Non-technical summary

Introduction

CGO Ecology Ltd was instructed by Mace Ltd, on behalf of the Ministry of Justice, to conduct a series of bat emergence/re-entry surveys of potential roosts at HMP Gartree, Market Harborough, Leicestershire. The Ministry of Justice proposes a development as part of its New Prisons Programme on land used to graze sheep, centred on (SP 7052 8873). The Local Planning Authority (LPA) is Harborough District Council.

Methodology

Brindle & Green Ltd (B&G) undertook dusk and dawn surveys as subconsultants for CGO Ecology Ltd, following recommendations from a Preliminary Ecological Appraisal (PEA) by Ramboll Ltd, adjusted after ground-truthing by B&G In May to June 2021. Dusk emergence and dawn re-entry surveys were undertaken at three buildings and four trees identified as having bat roost suitability, following standard guidelines. The surveys were led by Amy Trewick (CL18-licensed) and Ellen Marshall (CL17-licensed), with other suitably-experienced ecologists with full-spectrum electronic detectors.

Results

No bat emergences or re-entries were detected. Moderate common pipistrelle activity was recorded on all surveys, with a few noctule passes, and occasional registrations of soprano pipistrelle, Nathusius' pipistrelle, and a *Myotis* species.

Conclusions, mitigation, enhancement recommendations

No bat roosts were identified during the surveys, therefore roosting bats are not considered a constraint to the development. Foraging and commuting habitat may be indirectly impacted by disturbance due to lighting and increased traffic during construction. Scheme proposals show that there will be direct loss of these habitats, such as the removal of hedgerows.

Mitigation measures will include a sensitive lighting plan, with no new nocturnal lighting on Welland Avenue. Batboxes will be installed in trees northwest of Welland Avenue, to encourage bat use of those areas. Grassland enhancement there will increase its carrying capacity for invertebrates, and therefore increase the carrying capacity for populations of bats which feed upon them. A separate bat activity report will be issued to assess the impacts on bats using the site for foraging and/or commuting.

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1.2. Legal protection

All UK bats and their roosts are protected by the Wildlife and Countryside Act 1981 (as amended) and the Habitats Regulations 2017 (as amended). Bats may roost in crevices in building roofs, loft voids, and other built features, or in trees and other natural cavities.

1.3. Authors, surveyors

Lead author Dr Chris Gleed-Owen MCIEEM is Director and Principal Ecologist of CGO, project manager for the Gartree 2 phase 2 ecological surveys. Amy Trewick ACIEEM (Natural England level 2/CL18 bat licence), formerly of Brindle & Green Ltd (B&G), is co-author of this report. She conducted the bat Preliminary Roost Assessment (PRA) of trees and buildings to ground-truth Ramboll's findings, initial bat activity surveys, and other phase 2 surveys for Gartree 2.

B&G was commissioned to carry out the surveys as subconsultant to CGO. The nocturnal bat surveys were led by Amy Trewick (CL18-2018-37960-CLS-CLS) initially, and then by Ellen Marshall (CL17-2017-28407-CLS-CLS), Adrian Cox (CL18-2019-43340-CLS-CLS) and John Harvey (CL17-2018-34117-CLS-CLS), assisted by Kinzie Watts, Veronica Cantero Sanchez, Kerry Baker, Phoebe Collier, and Reece Rockley.

This report aims to follow CIEEM (2017) guidance, and provide sufficient information to assist an EclA conforming to CIEEM (2018) guidance.

1.4. Site context

The development site is land to the south of HMP Gartree, predominantly used to graze sheep. It comprises fields of poor semi-improved grassland, with hedgerows, and lines of trees. The red line includes a wider area to the northwest of Welland Avenue, set aside for Biodiversity Net Gain (BNG) habitat enhancements.

The wider landscape in which HMP Gartree is situated is rural, with arable and pasture farming. It is primarily open in nature, with scattered residential properties and pockets of woodland. Hedgerows and treelines create interconnecting ecological corridors throughout the area. Within 1km to the southeast, a large new residential development at Airfield Farm is expanding the urban area of the town of Market Harborough.

1.5. Proposed works

An Outline Planning Application (OPA) is proposed, with all matters reserved except for access and scale for the construction of a new Category B prison of up to 82,555m² GEA (gross external area) within a secure perimeter fence together with access parking, landscaping, and associated engineering works on land adjacent to HMP Gartree, Gallow Field Road, Market Harborough, Leicestershire, LE16 7RP.

The indicative site layout proposes a range of buildings and facilities typical of a Category B resettlement prison, including seven new houseblocks (1,715 prisoners in total), supporting development including kitchen and other facilities, ancillary development including car parking (c.523 spaces), internal road layout, and perimeter fencing. The house blocks will be four storeys in height, whilst the other buildings will range from one to three storeys.

The new prison will be designed and built to be highly sustainable and to exceed local and national planning policy requirements in terms of sustainability. MoJ's aspirations include targeting near-zero carbon operations, 10% BNG, and at least BREEAM 'Excellent' certification, with endeavours to achieving BREEAM 'Outstanding'.

2. Methodology

2.1. Desk study

A Preliminary Ecological Appraisal (PEA) conducted by Ramboll (Molesworth, 2020), including a Leicestershire and Rutland Environment Records Centre (LRERC) 2km search. This guided Mace's instruction of phase 2 ecological surveys.

CGO was instructed in December 2020, with bat roost surveys to be conducted in spring/summer 2021. An updated LRERC search was sought by CGO in July 2021. The Defra MAGIC website was also queried (<https://magic.defra.gov.uk/MagicMap.aspx>).

2.2. Preliminary Roost Assessment

Ramboll's PEA (Molesworth, 2020) included a Preliminary Roost Assessment (PRA) of all trees and buildings on site. This recommended nocturnal bat surveys (activity and roost presence-absence). Buildings with low, medium, or high roost potential would need one, two, or three dusk/dawn surveys respectively. Trees with medium or high roost potential would need two, or three dusk/dawn surveys respectively (cf. Collins, 2016).

B&G conducted ground-truthing of the buildings and trees identified by Ramboll (Molesworth, 2020) as requiring further assessment. This was effectively a Preliminary Roost Assessment (PRA) exercise (cf. Collins, 2016). It revised some of the Ramboll findings, and added a building and several trees to the Zone of Influence (Zol) targets that required further survey.

The PRA followed published Covid-19 safety advice (BCT, 2020; CIEEM, 2020; IUCN, 2020).

The ground-truthing/PRA inspections were carried out during daylight hours and in accordance with standard methodology (Collins, 2016). They were aided by a powerful torch and close-focus binoculars from ground level. Internal inspections of buildings were undertaken where possible and safe to do so.

Cavities, cracks, and crevices which may offer potential emergence points or suitable roosting features for bats were identified and, where accessible, were also searched. In addition, the inspection recorded any evidence of use by bats, including feeding remains, claw marks, staining from urine and fur, droppings or bats themselves.

Features at the buildings and trees with opportunity for roosting were recorded and categorised according to their level of suitability, from negligible to high (cf. Collins, 2016). Suitability was determined by factors including type, size, and locations of features; site context, local environmental conditions, and proximity to suitable bat foraging habitat.

2.3. Emergence/re-entry surveys

Nocturnal surveys (dusk emergence, dawn re-entry, totalling 18 surveyor sessions) of three buildings (B1-3) and four trees (T1-4) in the Zol took place between 25th May and 21st July 2021. This was to determine bat roost presence-absence, and characterise roosts, as per standard survey guidelines (Collins, 2016). Surveyors were positioned to observe potential bat emergence and re-entry points on buildings and trees.

Surveyors used full-spectrum bat survey and monitoring equipment (Echo Meter Touch 2 detectors paired with iPads) to detect and record bats in the field. Full-spectrum and time-expansion calls were later analysed manually using Kaleidoscope Viewer software by Wildlife Acoustics. Where possible, calls were identified to species level.

Surveys were carried out from surveyor positions spread around the buildings and trees, as detailed in Appendix 2, to provide full visual coverage of potential bat entry/exit points.

Any sightings of bats emerging from and/or returning to the buildings, bat activity/behaviour (where visible), and targeted bat calls suggesting a particular interest in features at the buildings/walls/structure, were recorded.

The full results, dates, times, sunset/sunrise times, and weather conditions are provided in Appendix 2.



Figure 3 – Buildings and trees subjected to nocturnal surveys for bat roosts.

Building or tree	Grid reference	Position within Zol
Building B1	SP 70648 88890	In development area
Building B2	SP 70688 88917	In development area
Building B3 (TN10)	SP 70640 88872	In development area
Tree T1	SP 70072 88678	Ash tree, north side of Welland Ave.
Tree T2	SP 70026 88648	Ash tree, north side of Welland Ave.
Tree T3 (TN19)	SP 70040 88656	Ash tree in defunct hedge, north side of Welland Ave.
Tree T4 (TN17)	SP 70058 88715	Dead ash tree in intact hedgerow, north of Welland Ave.

Table 1 – Buildings and trees subjected to bat nocturnal surveys, with Ramboll (Molesworth, 2020) PEA target note numbers in parentheses.

2.4. Incidental observations

Sightings of notable wildlife observed during the bat emergence/re-entry surveys were also recorded. In particular, a sighting of barn owl (*Tyto alba*), and negative results from trees with previous barn owl evidence, have been fed into the relevant survey for that species.

2.5. Limitations

There were no significant constraints on the surveys. The surveys were originally scheduled to start in early to mid-May, but they were postponed due to inclement and unseasonably-cold weather. However, the new seasonal position was optimal for all nocturnal surveys.

3. Baseline ecological conditions

3.1. Desk study

Natural England has issued only one European Protected Species (EPS) mitigation licence for bats within 2km, for common pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared bat (*Plecotus auritus*) around 1.3km south.

The LRERC (2021) search yielded 121 bat records within 2km, comprising common pipistrelle (18 records), soprano pipistrelle (*Pipistrellus pygmaeus*, 10), Nathusius' pipistrelle (*Pipistrellus nathusii*, 5), undetermined pipistrelle (40), brown long-eared bat (10), Daubenton's bat (*Myotis daubentonii*, 3), Natterer's bat (*Myotis nattereri*, 1), undetermined *Myotis* (1), noctule (*Nyctalus noctula*, 12), serotine (*Eptesicus serotinus*, 1), and 20 of unidentified bat species.

The nearest bat record is for a non-specific roost in a property within the Gartree residential estate to the west of the existing prison, outside the ZoI of the proposed development.

3.2. Emergence/re-entry surveys

No bat emergences or re-entries were detected. Therefore, the results of the surveys indicate that bat roosts are likely to be absent from the three buildings in the development area, and from the four trees within the ZoI along Welland Avenue.

Moderate common pipistrelle activity was recorded on all surveys, with a few noctule passes, and occasional registrations of soprano pipistrelle, Nathusius' pipistrelle, and an unidentified *Myotis* species.

Appendix 2 details the species recorded on each survey, with information on weather and timings, and a plan of bat activity observed.

A barn owl emerged from a tree adjacent to a survey position on 14th July 2021 (tree TN16 of Ramboll, 2020). Grey squirrel (*Sciurus carolinensis*) was seen at T2 on 8th June 2021.

4. Impact assessment

No bat roosts were identified and therefore roosting bats are considered absent. The results indicate that bat roosts will not be impacted by the proposed development. However, in the highly-unlikely event that a bat is found during works, then works must cease immediately and CGO Ecology be consulted.

Construction activities could cause an increase in noise, lighting, and other effects along Welland Avenue, which might impact commuting routes and foraging areas.

5. Mitigation

Permanent lighting must be avoided on Welland Avenue, and a sensitive lighting plan be used during construction. No nocturnal lighting will be possible along Welland Avenue, and along retained woodland edges and hedgerows immediately south of HMP Gartree. This is to maintain currently-dark habitat used by foraging and commuting bats.

New habitat provisions will offset the loss of foraging habitat in due course, especially woodland on the south and east edge of the site. However, there will be a lag of up to 30 years before this is fully functional for bats, and a net reduction in available habitats in the short to medium term. New batbox provisions in land northwest of Welland Avenue will be used to encourage use of that area, and to assist in compensating the loss of potential roosting opportunities in buildings lost to the development. Grassland enhancement northwest of Welland Avenue will also provide better foraging habitat than at present.

The final results of the monthly bat activity surveys (April to October 2021) will better inform impact assessment of the development on bat commuting routes and foraging areas, and may require additional mitigation.

6. Residual effects, enhancements

There will be no residual effects on bat roosts after mitigation. Therefore, enhancements are possible by providing additional new roosting habitat for bats.

At least 20 batboxes (artificial roosts), for a range of species and roost types, will be installed in suitable locations on retained trees around the prison estate. The numbers and types of batboxes provided will be decided upon completion of the bat activity surveys, once a full picture is known of commuting and foraging routes through the whole April-October season.

7. References

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8. Appendices

Appendix 1 - Photographs

Appendix 2 - Emergence/re-entry survey results

Appendix 1 – Photographs



Plate 1- Interior of B1.



Plate 2 – View east along Welland Avenue.



Plate 3 – B2 front (west) elevation.



Plate 4 – B2 rear (east) elevation.



Plate 5 – B3 with B1 beyond.



Plate 6 – View west along Welland Avenue.

Appendix 2 – Bat Emergence/Re-entry Survey Results 2021

Survey 1: Building B3 (TN10) – 25th May 2021 (Dusk)

Survey site: Gartree 2, Market Harborough Building B3 (TN10). Surveyor positions: Facing building from Northern and Southern positions.

Date: 25/05/2021.

Sunset/sunrise: 21:07

Start: 20:52.

End: 22:37

Weather conditions:

Start temperature: 13°C. Finish temperature: 8°C.

Precipitation 0, Wind strength 1.5/5, Cloud cover 0/8.

Humidity: High throughout.

Surveyors: John Harvey (JH) & Ellen Marshall (EM).

Equipment: EM Touch & iPad/iPhone.

Survey summary: Brief calls from common pipistrelles and a commuting passage utilising the track and travelling onwards in a Westerly and North-easterly direction. No emergences.

Incidental observations: Full Moon. Curlew heard calling.

Survey constraints: N/A.

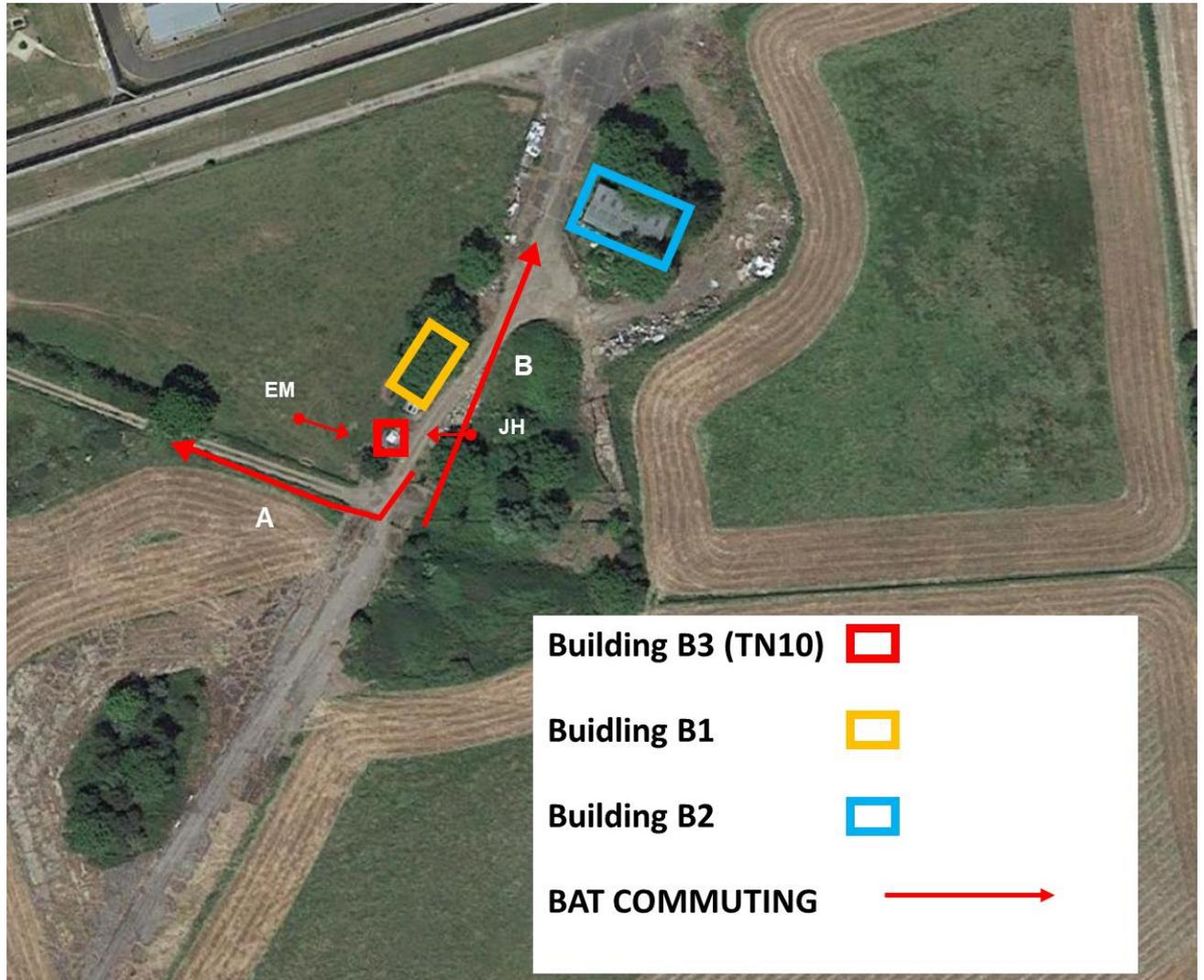
Table 1 - All Bat Activity Recorded During Survey 1 of; Building B3 (TN10) (Dusk) on 25/05/2021 Refer to Fig. 1.

Time (24 Hrs)	Surveyor	Species ¹	No. bats	Bat Activity ²	Map Annotation
21:39	JH	P.pip	1	HNS, Brief call	
21:43	EM	P.pip	1	BC, Up the track and flew West	A
21:51	EM	P.pip	1	HNS	
21:52	JH	P.pip	1	HNS, Brief call	
21:58	JH	P.pip	1	BC, North-Eastern direction	B
22:36	JH	P.pip	1	HNS, Brief call	
22:38	EM	P.pip	1	HNS, Brief pass	

¹ P.pip – Common pipistrelle (*Pipistrellus pipistrellus*).

² HNS – Heard not seen; SNH – Seen not heard; BC – Bat Commuting; BF – Bat Foraging.

Figure 1: Survey 1: Building B3 (TN10) – 25th May 2021 (Dusk) - Activity map.



Survey 1: Tree T3 (TN19) – 8th June 2021 (Dawn).

Survey site: Gartree 2, Market Harborough (Tree T3 (TN19)). Surveyor positions: Facing tree southern aspect.

Date: 08/06/2021.

Sunset/sunrise: 04:42

Start: 03:13.

End: 04:57.

Weather conditions:

Start temperature: 15°C. Finish temperature: 12°C.

Precipitation 0, Wind strength 0/5, Cloud cover 1/8.

Humidity start: 67%. Humidity finish: 73%.

Surveyors: Ellen Marshall (EM).

Equipment: EM Touch & iPad/iPhone.

Survey summary: Brief calls from Common Pipistrelles, Brown long eared and Myotis species. Sightings of foraging Common Pipistrelles and Brown long eared bats under the canopy and at low level. No bats were observed to return to roost.

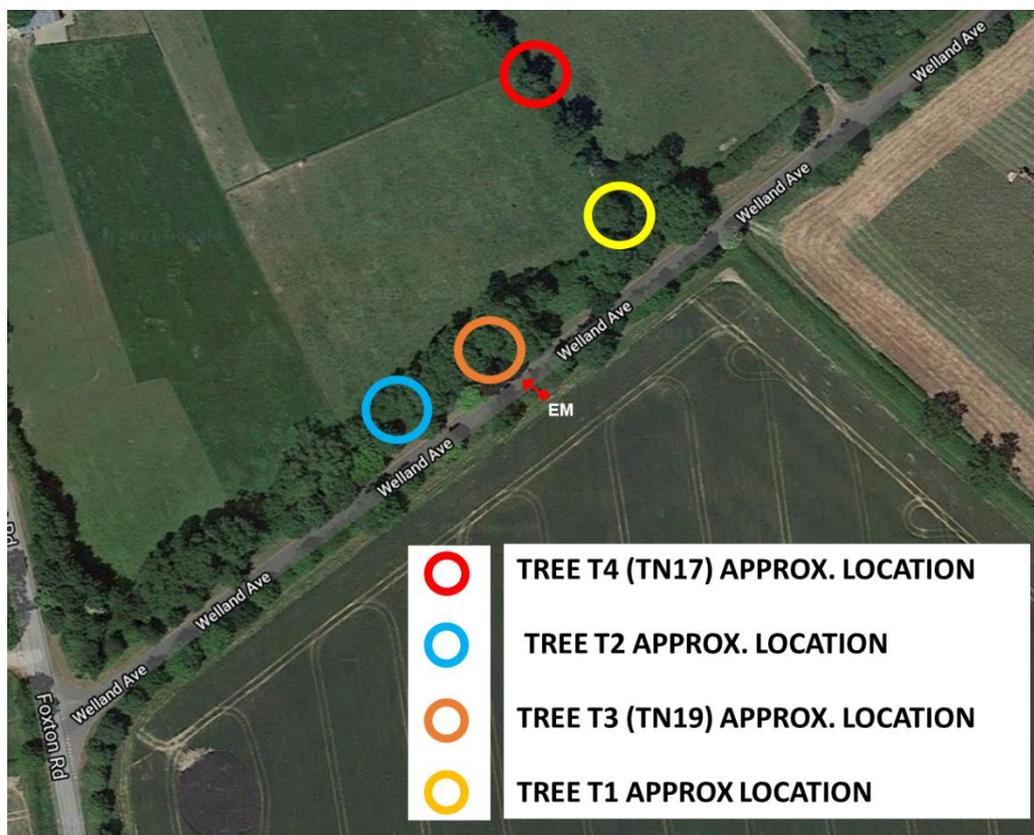
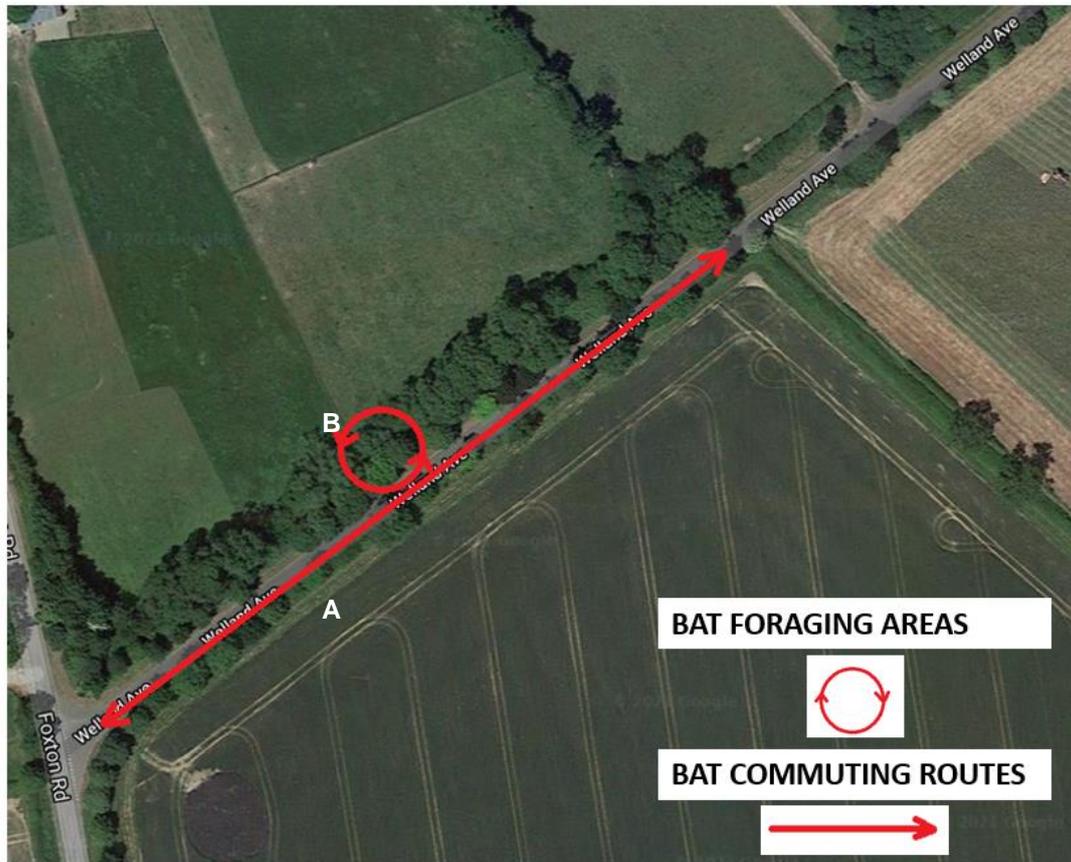
Incidental observations: N/A.

Survey constraints: N/A.

**Table 2 - All Bat Activity Recorded During Survey 1 of; Tree T3 (TN19) (Dawn) on the 08/06/2021
Refer to Fig. 2.**

Time (24 Hrs)	Surveyor	Species	No. bats	Bat Activity	Map Annotation
03:18	EM	Ppip	1	HNS but came very close – commuting on road highly possible.	A
03:25	EM	Ppip	1	HNS, Brief calls	
03:35	EM	BLE	1	Circling trunk/foraging from foliage but did not return	B
03:42	EM	Ppip	1	HNS, faint call	
03:47	EM	BLE	1	Flew south into road, low level around seated head height	B
03:49	EM	Ppip	1	Foraging, under the canopy	B
03:52-04:04	EM	Ppip	2	Foraging, low over the vegetation	B

Figure 2: Survey 1: Tree T3 (TN19) – 8th June 2021 (Dawn) - Activity map and Location.



Survey 1: Tree T1 – 8th June 2021 (Dawn).

Survey site: Gartree 2, Market Harborough (Tree T1). Surveyor positions: Facing tree, southern aspect
Date: 08/06/2021.

Sunset/sunrise: 04:42

Start: 03:13.

End: 04:57.

Weather conditions:

Start temperature: 15°C. Finish temperature: 12°C.

Precipitation 0, Wind strength 0/5, Cloud cover 1/8.

Humidity start: 67%. Humidity finish: 73%.

Surveyors: Adrian Cox (AC).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergences or returns. Survey generally very quiet with little bat activity recorded throughout. Feature was near cluttered hedgerow and thick treeline. One species of pipistrelle was recorded briefly under the canopy.

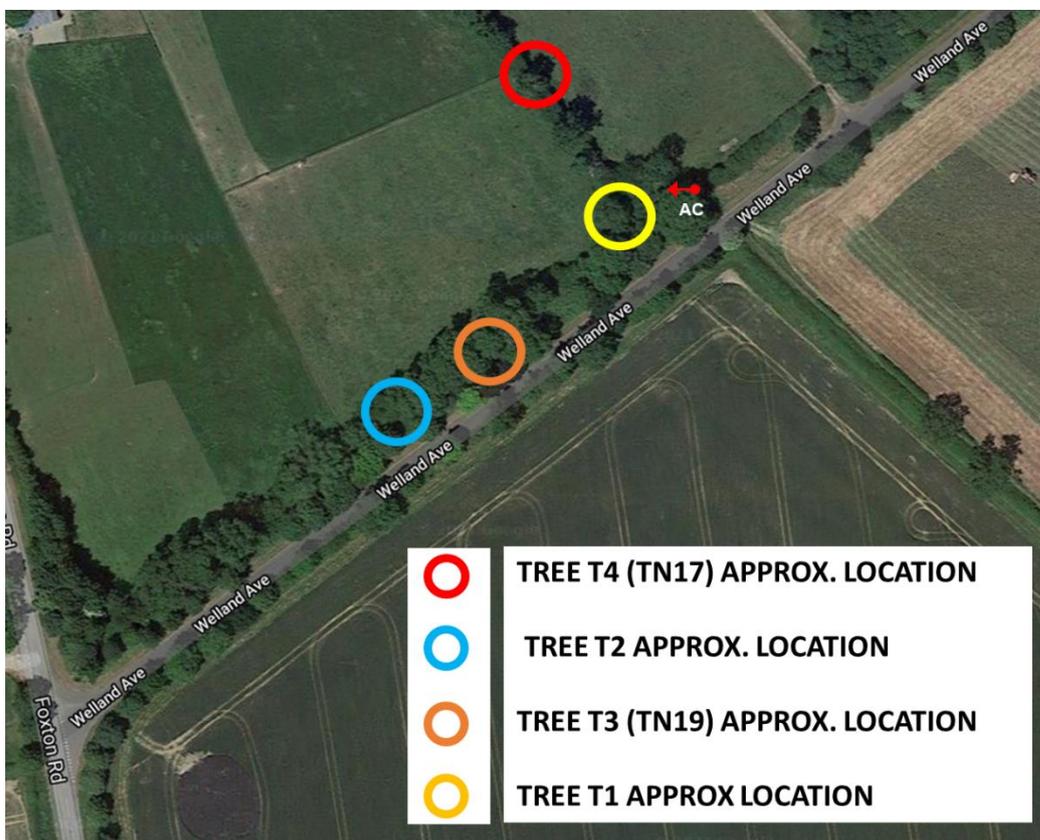
Incidental observations: N/A.

Survey constraints: N/A.

Table 3 - All Bat Activity Recorded During Survey 1 of; Tree T1 (Dawn) on the 08/06/2021 Refer to Fig. 3.

Time (24 Hrs)	Surveyor	Species	No. bats	Bat Activity	Map Annotation
03:32	AC	P.pip	1	~3m under the canopy, 2 passes observed	A

Figure 3: Survey 1: Tree T1 – 8th June 2021 (Dawn) - Activity map.



Survey 1: Tree 2 – 8th June 2021 (Dawn).

Survey site: Gartree 2, Market Harborough (Tree T2). Surveyor positions: Facing tree, southern aspect.

Date: 08/06/2021.

Sunset/sunrise: 04:42

Start: 03:13.

End: 04:57.

Weather conditions:

Start temperature: 15°C. Finish temperature: 12°C.

Precipitation 0, Wind strength 0/5, Cloud cover 1/8.

Humidity start: 67%. Humidity finish: 73%.

Surveyors: John Harvey (JH).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergences/returns recorded. Brief calls from common pipistrelles, brown long eared and *Myotis* species. Sightings of foraging common pipistrelles and brown long eared bats under the canopy and at low level.

Incidental observations: Squirrel noted emerging from the observed feature at dawn

Survey constraints: N/A.

Table 4 - All Bat Activity Recorded During Survey 1 of; Tree T2 on the 08/06/2021 Refer to Fig. 4.

Time (24 Hrs)	Surveyor	Species³	No. bats	Bat Activity	Map Annotation
03:15	JH	P.pip	1	Bat Activity	
03:17	JH	MYO	1	HNS, Brief calls	
03:25	JH	P.pip	1	HNS, Brief calls	
03:33	JH	BLE	1	HNS, Brief calls	A
03:34	JH	P.pip	1	Flew past towards tree TN19 low flying over ruderal vegetation	
03:42	JH	P.pip	1	HNS	
03:47	JH	BLE	1	HNS	A
03:48-04:04	JH	P.pip	1	Foraging under the canopy	A

³ BLE – Brown long-eared bat (*Plecotus auritus*), MYO – *Myotis* sp.

Survey 1: Tree T4 (TN17) – 11th June 2021 (Dawn).

Survey site: Gartree 2, Market Harborough (Tree T4 (TN17)). Surveyor positions: Facing tree, north eastern and south eastern aspect.

Sunset/sunrise: 04:41

Start: 03:10.

End: 04:55.

Weather conditions:

Start temperature: 17°C. Finish temperature: 17°C.

Precipitation 0, Wind strength 2/5, Cloud cover 7/8.

Humidity start: 92%. Humidity finish: 92%.

Surveyors: Kinzie Watts (KW) and Veronica Cantero Sanchez (VC).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergencies/returns recorded. Common pipistrelles foraging within the tree canopy and above the trees, brown long eared foraging and commuting. Myotis species commuting past infrequently. Occasional pass of noctules which locations were assumed commuting over but not seen.

Incidental observations: N/A.

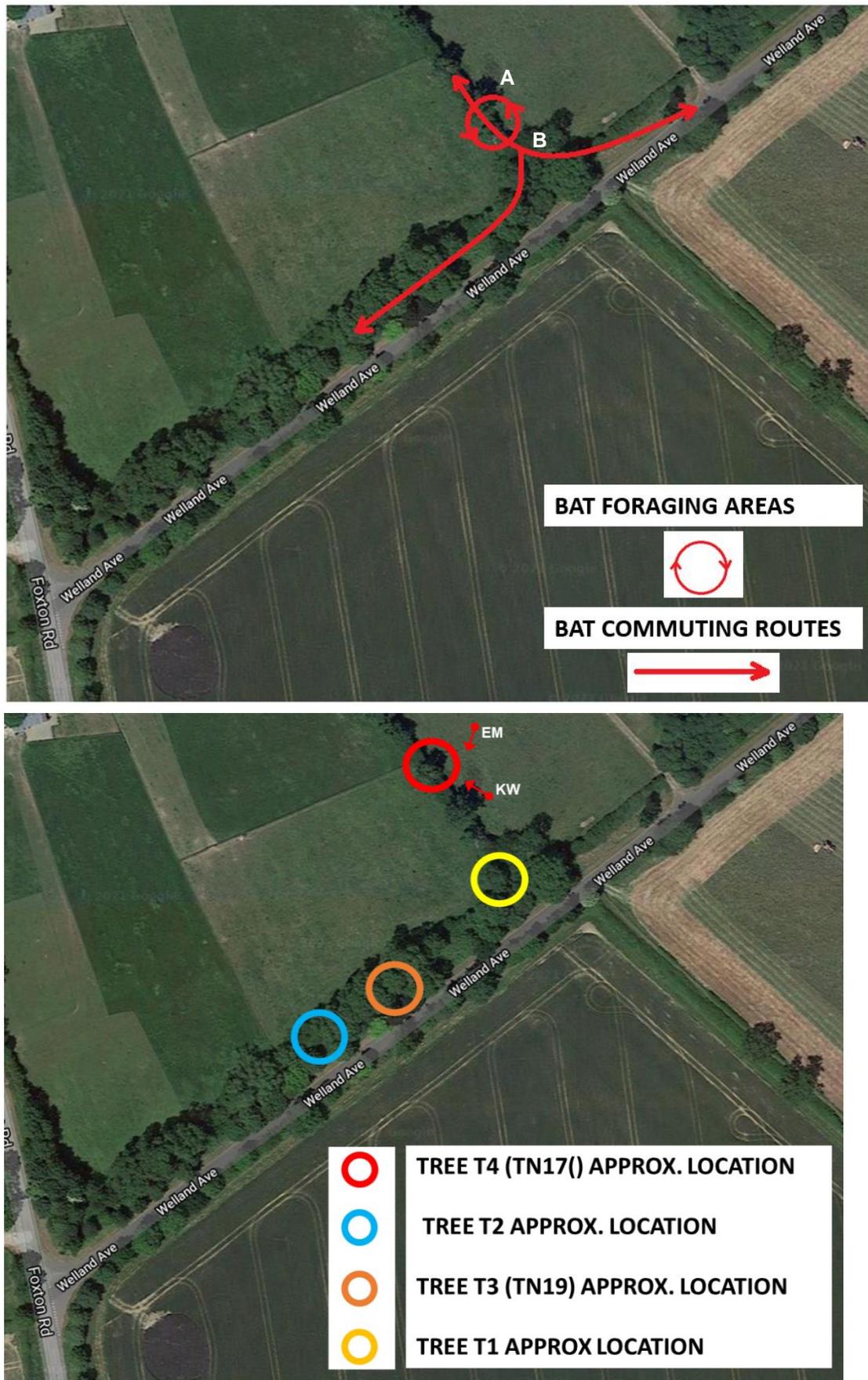
Survey constraints: N/A.

Table 5 - All Bat Activity Recorded During Survey 1 of; Tree T4 (TN17) (Dawn) on the 11/06/2021 Refer to Fig. 5.

Time (24 Hrs)	Surveyor	Species ⁴	No. bats	Bat Activity	Map Annotation
03:10-03:25	KW	P.pip	1-5	BF, continuously around the trees and bats commuting along the East elevation	A
03:25-03:40	KW	P.pip, BLE & MYO	3-9	BF, P.pip in circles above surveyors head and over to Tree 17 - BLE pass and MYO pass	A
03:40-03:55	KW	P.pip & MYO	2-9	BF, P.pip passes with infrequent MYO passes	A
03:55-04:04	KW	P.pip	1-5	Activity less frequent, with P.pip circling and flying to the woodland strip – 04:04 all activity ceased	B
03:12-03:42	VC	P.pip	1-5	BF, continuously around the trees	A
03:25	VC	BLE	1	HNS	
03:27	VC	BLE	1	BF around the trees	
03:34	VC	BLE	1	HNS	
03:45	VC	P.pip	1	HNS	
03:46	VC	BLE	1	BC, Along hedgerow from South to North	B
03:50	VC	P.pip	1	HNS	
03:57	VC	P.pip	1	BF around the trees	
04:36	VC	N.noc	1	HNS	

⁴ N.noc – Noctule (*Nyctalus noctula*)

Figure 5: Survey 1: Tree T4 (TN17) – 11th June 2021 (Dawn) - Activity map.



Survey 1: Building B1 – 22nd June 2021 (Dusk).

Survey site: Gartree 2, Market Harborough Building 1 (Dome Shelter). Surveyor positions: Southern elevation facing North, Northern elevation facing South.

Date: 22/06/2021.

Sunset/sunrise: 21:30.

Start: 21:15.

End: 23:00.

Weather conditions:

Start temperature: 14°C. Finish temperature: 10°C.

Precipitation 0, Wind strength 1/5, Cloud cover 0/8.

Humidity start: 66%. Humidity finish: 73%.

Surveyors: John Harvey (JH) and Veronica Cantero Sanchez (VC).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergencies. Common pipistrelles foraging and commuting down the path and around the trees throughout the survey.

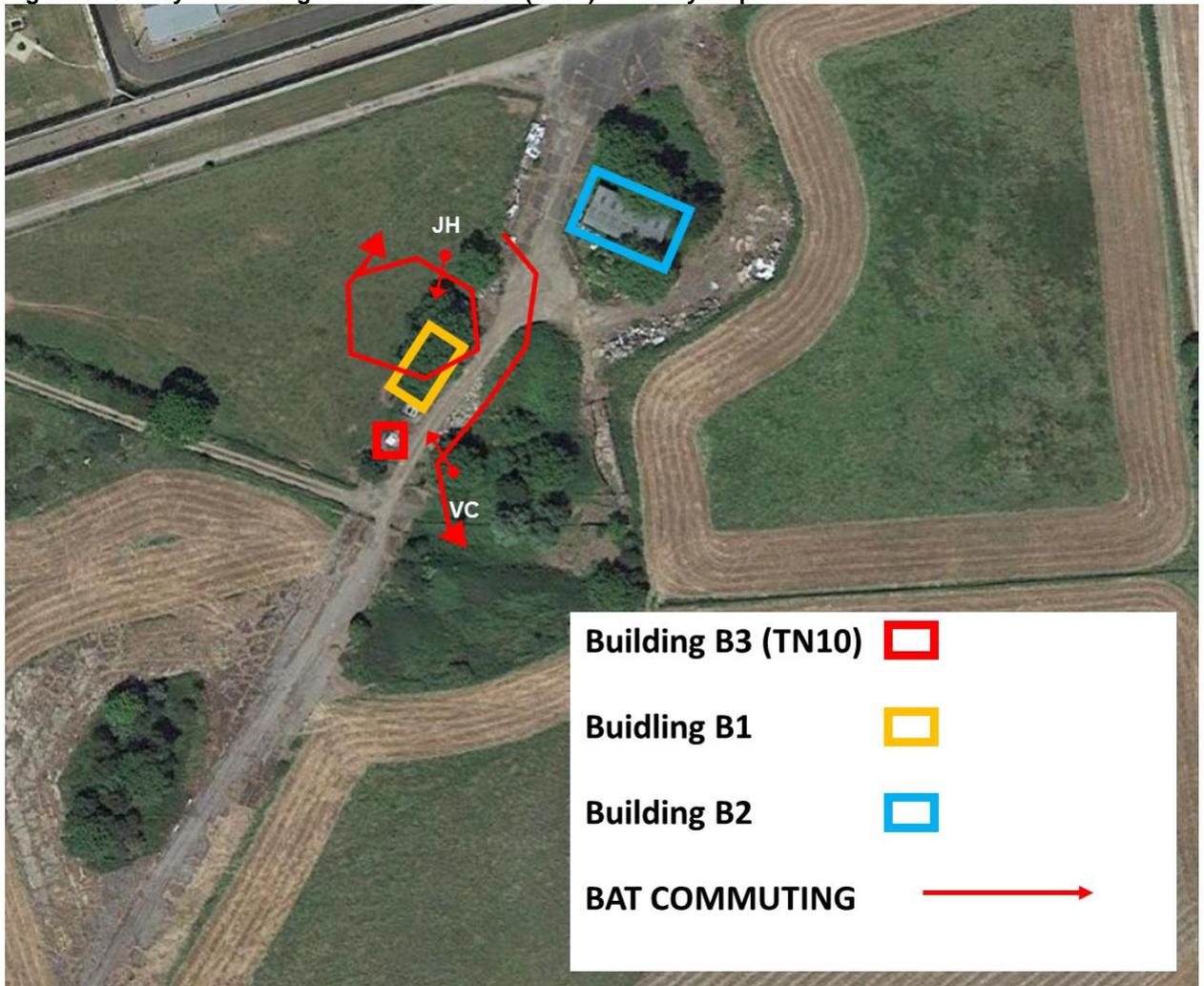
Incidental observations: N/A.

Survey constraints: N/A.

Table 6 - All Bat Activity Recorded During Survey 1 of; Building B1 (Dusk) 22/06/2021 Refer to Fig. 6.

Time (24 Hrs)	Surveyor	Species	No. bats	Bat Activity	Map Annotation
22:05	VC	P.pip	1	HNS	
22:09-11	VC/JH	P.pip	1	BF, Over tree canopy	A
22:14	VC	P.pip	1	BF, Over tree canopy	A
22:16	JH	P.pip	1	BC, Down the path	B
22:17	VC	P.pip	1	BF, Over tree canopy	A
22:18	VC	P.pip	1	BF, Down the path and over tree canopy	A
22:18	JH	P.pip	1	BC, Down the path	B
22:22	JH	P.pip	1	BF, Bat circling around the path	A
22:25	VC	P.pip	1	BF, Down the path and over tree canopy	A
22:25	JH	P.pip	1	BC, Down the path	B
22:39	JH	P.pip	1	HNS	

Figure 6: Survey 1: Building 1 – 22nd June 2021 (Dusk) - Activity map.



Survey 1: Building B2– 29th June 2021 (Dusk).

Survey site: Gartree 2, Market Harborough (Building B2). Surveyor positions: Eastern and Western elevations.

Date: 29/06/2021.

Sunset/sunrise: 21:30.

Start: 21:15.

End: 23:00.

Weather conditions:

Start temperature: 13°C. Finish temperature: 14°C.

Precipitation 0, Wind strength 0/5, Cloud cover 2/8.

Humidity start: 81%. Humidity finish: 90%.

Surveyors: Kerry Baker (KB) and Veronica Cantero Sanchez (VC).

Equipment: EM Touch & iPad/iPhone.

Survey summary: No emergences. Generally low levels of activity observed,, with bats primarily commuting through the area, with the majority being in the distance. One common pipistrelle bat sighted foraging in trees to the east of building. Occasional passes of noctules commuting North.

Incidental observations: N/A.

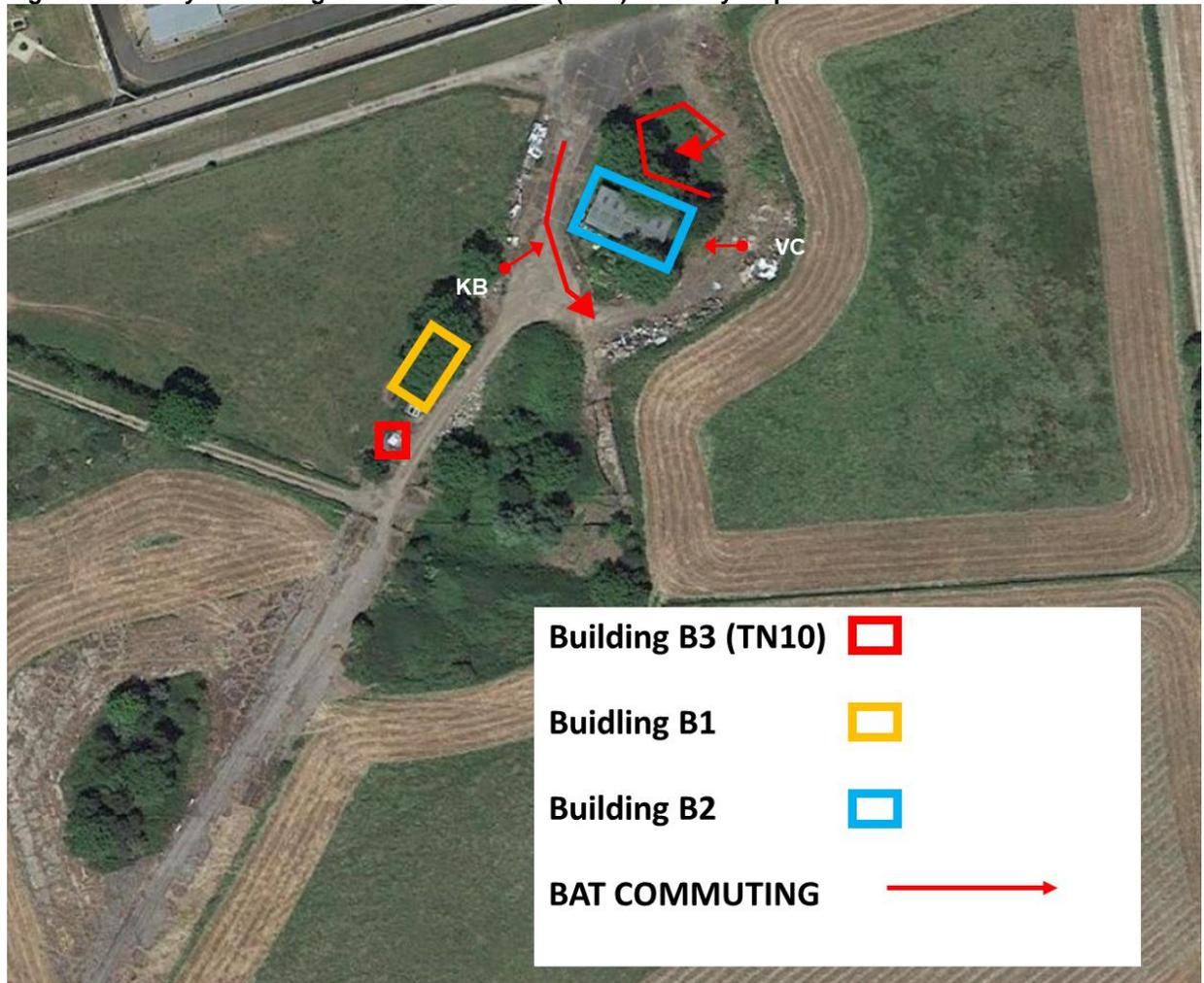
Survey constraints: N/A.

**Table 7 - All Bat Activity Recorded During Survey 1 of; Building B2 (Dusk) on the 29/06/2021
Refer to Fig. 7.**

Time (24 Hrs)	Surveyor	Species⁵	No. bats	Bat Activity	Map Annotation
22:11	KB / VC	N.noc	1	HNS, Commuting pass	
22:12	VC	N.noc	1	HNS	
22:12	KB / VC	P.pip	1	HNS, Brief pass in the distance	
22:16	VC	P.pip	1	BF at Eastern tree	A
22:16	KB	N.noc	1	HNS, Brief pass in the distance	
22:17	KB	P.pip	1	Brief pass then appeared and commuted	
22:37	KB	P.pyg	1	Faint pass	
22:37	VC	P.pip	1	Brief pass in the distance	
22:49	KB	N.noc	1	HNS, Brief pass in the distance	
22:50	KB	N.noc	1	BC, Overhead North	B
22:50	KB	P.pip	1	HNS BC	
22:56-23:00	KB	P.pip	1	BC, Frequent pulses for 4 minutes	B

⁵ P.pyg – Soprano pipistrelle (*Pipistrellus pygmaeus*)

Figure 7 - Survey 1: Building B2 – 29th June 2021 (Dusk) - Activity map.



Survey 2: Tree T3 (TN19)– 6th July 2021 (Dusk).

Survey site: Gartree 2, Market Harborough Tree T3 (TN19). Surveyor positions: Southern elevation facing North,

Date: 06/07/2021.

Sunset/sunrise: 21:27.

Start: 21:12.

End: 22:57.

Weather conditions:

Start temperature: 13 Degrees Celsius. Finish temperature: 14 Degrees Celsius.

Precipitation 0, Wind strength 0/5, Cloud cover 2/8.

Humidity start: 81%. Humidity finish: 90%.

Surveyors: Ellen Marshall (EM).

Equipment: EM Touch & I-pad/I-phone.

Survey summary: No emergences. Continuous foraging from a pair of common pipistrelles beneath canopy of treeline.

Incidental observations: N/A.

Survey constraints: Survey finished at 22:57 due to onset of high winds and showers.

Table 2 - All Bat Activity Recorded During Survey 2 Tree 3 (TN19) (Dusk) 29/06/2021 Refer to Fig. 1.

Time (24 Hrs)	Surveyor ⁶	Species ⁷	No. bats	Bat Activity	Map Annotation
21:37	EM	P.pip	1	HNS – possibly behind surveyor along road	
21:43 – 21:58	EM	P.pip	2	BF continuously within/beneath tree canopy. Calls indicative of 2x bats and 2x individuals seen until 21:58	A
21:59 – 22:14	EM	P.pip	2	BF activity as before however light levels too low to see bats underneath tree canopy	A
22:46	EM	P.pip	1	BF for sustained periods – HNS however likely that bat activity continued as previously	

HNS - Heard not seen; Unk - unknown species; Nnoc - noctule (*Nyctalus noctula*); Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); MYO – Myotis sp (Brandt's, whiskered, Daubenton's, Natter's, Bechstein's); BLE – Brown Long eared.

Survey 2: Tree T2 – 6th July 2021 (Dusk)

Survey site: Gartree 2, Market Harborough (Tree T2). Surveyor positions:

Date: 06/07/2021.

Sunset/sunrise: 21:27.

Start: 21:12.

End: 22:57.

Weather conditions:

Start temperature: 13 Degrees Celsius. Finish temperature: 14 Degrees Celsius.

Precipitation 0, Wind strength 0/5, Cloud cover 2/8.

Humidity start: 81%. Humidity finish: 90%.

Surveyors: Phoebe Collier (PC)

Equipment: EM Touch & I-pad/I-phone.

Survey summary: No emergences. Foraging by common pipistrelle.

Incidental observations: N/A.

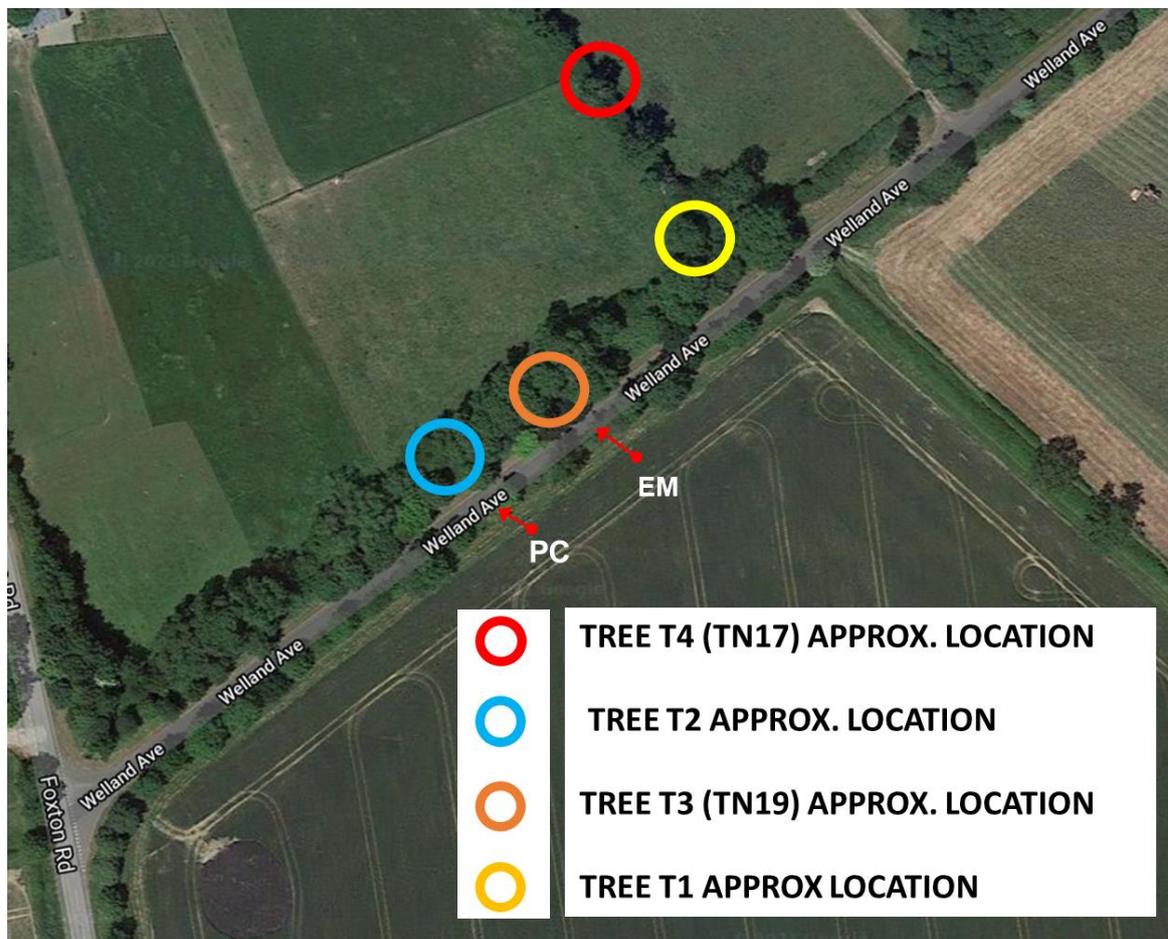
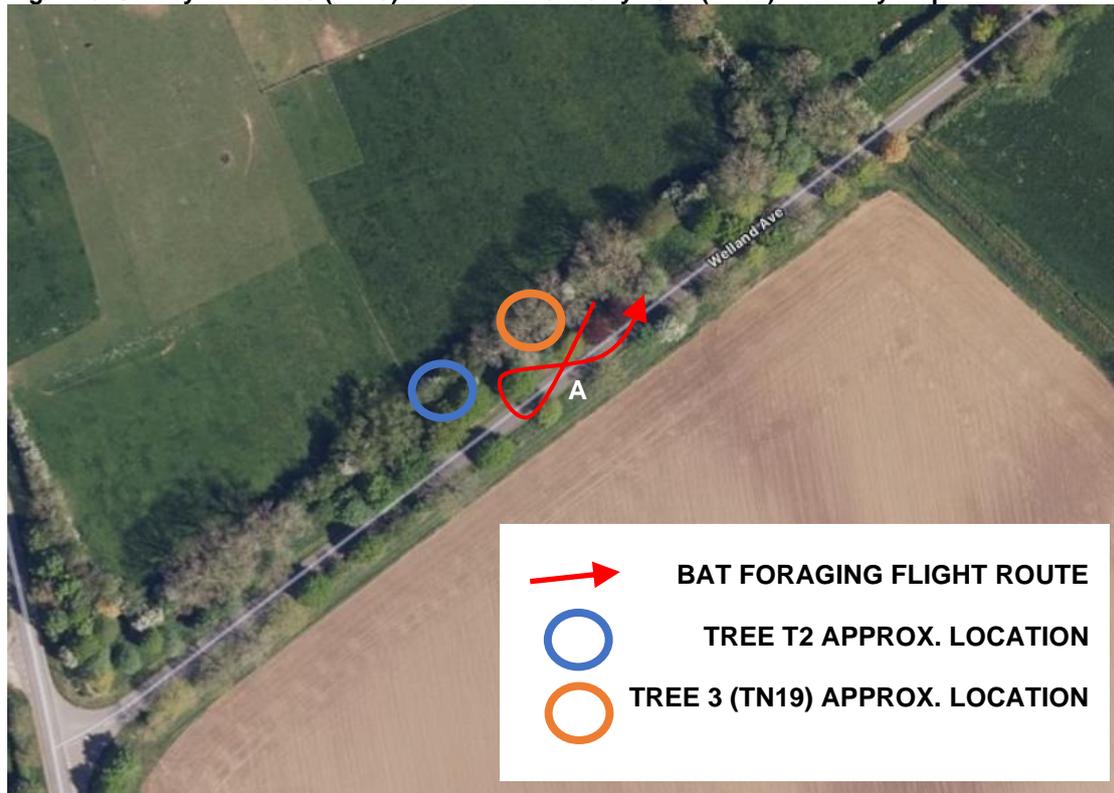
Survey constraints: Survey finished at 22:57 due to onset of high winds and showers.

Table 3 - All Bat Activity Recorded During Survey 2 Tree T2 (Dusk) 29/06/2021 Refer to Fig. 1.

Time (24 Hrs)	Surveyor ⁸	Species ⁹	No. bats	Bat Activity	Map Annotation
21:48	PC	P.pip	1	HNS - BF	
21:50	PC	P.pip	1	HNS	
21:53	PC	P.pip	1	HNS - BF	
21:48	PC	P.pip	1	HNS - BF	
22:05	PC	P.pip	1	HNS	
22:10	PC	P.pip	1	HNS	

HNS - Heard not seen; Unk - unknown species; Nnoc - noctule (*Nyctalus noctula*); Pip - *Pipistrellus* sp.; Ppip - common pipistrelle (*Pipistrellus pipistrellus*); MYO – Myotis sp (Brandt's, whiskered, Daubenton's, Natter's, Bechstein's); BLE – Brown Long eared.

Figure 8: Survey 2: Tree T3 (TN19) & Tree T2 – 6th July 2021 (Dusk) – Activity map



Survey 2: Tree T4 (TN17) – 14th July 2021 (Dusk).

Survey site: Gartree 2, Market Harborough (Tree T4 (TN17)). Surveyor positions: Facing tree.

Date: 14/07/2021.

Sunset/sunrise: 21:13.

Start: 20:58.

End: 22:59.

Weather conditions:

Start temperature: 17°C. Finish temperature: 17°C.

Precipitation 0, Wind strength 0/5, Cloud cover 0/8.

Humidity start: 70%. Humidity finish: 70%.

Surveyors: Kinzie Watts (KW) and Ellen Marshall (EM).

Equipment: EM Touch & iPad/iPhone.

Survey summary: Bats commuting and foraging along the tree lines in Easternly and Westerly directions, some bats commuting across the field and a few infrequent passes of *Nathusius pipistrelle* and *Serotine*.

Incidental observations: Barn owl (*Tyto alba*) emerging from adjacent Tree TN16 (Dead Tree) at 21:58.

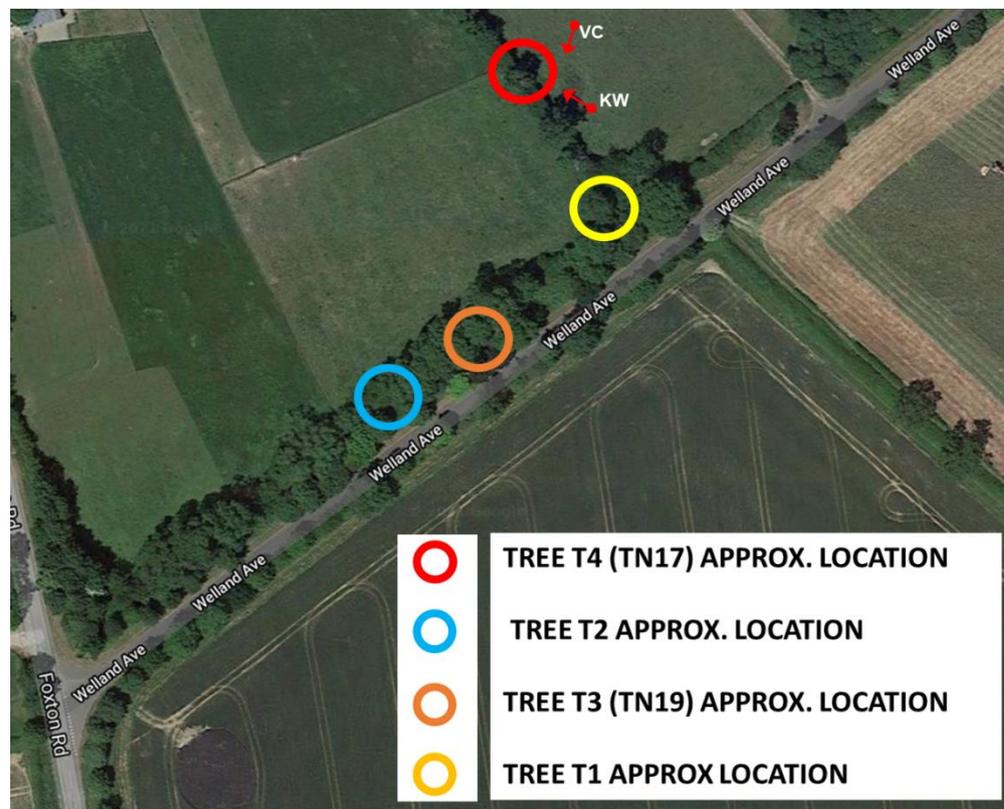
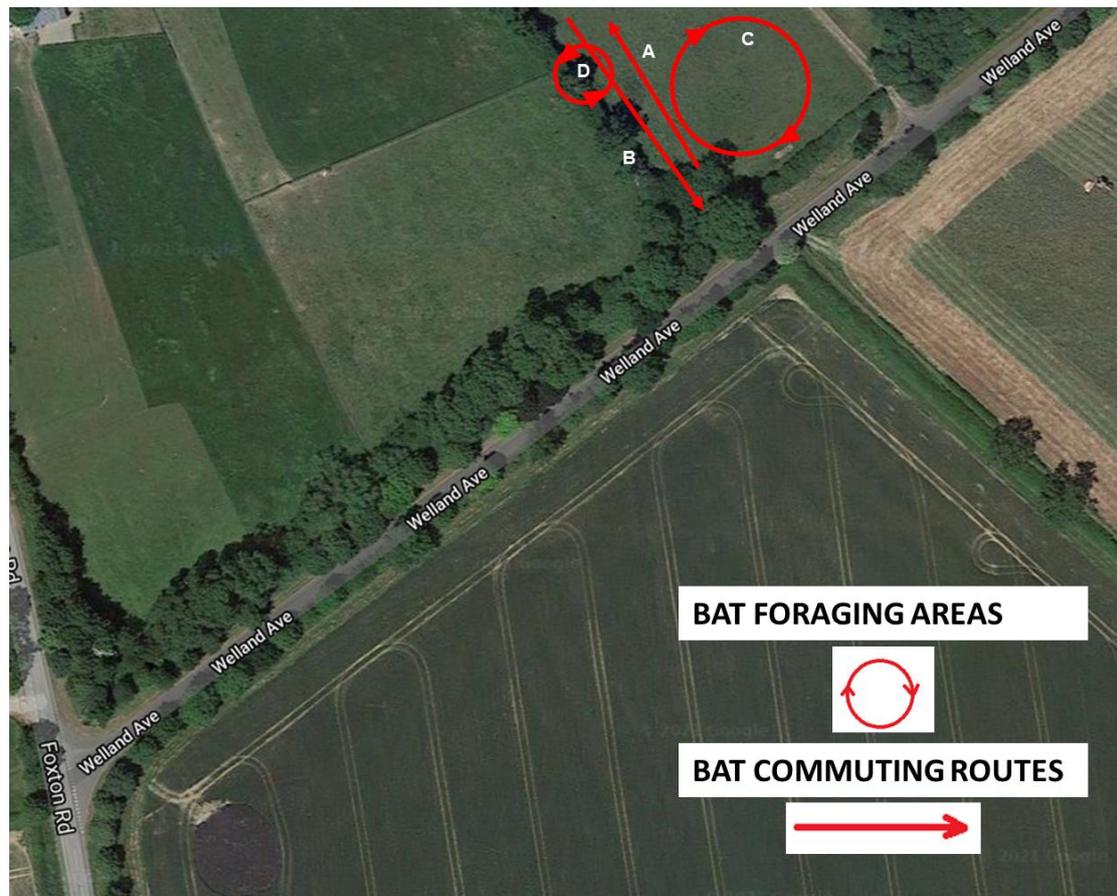
Survey constraints: N/A.

Table 9 - All Bat Activity Recorded During Survey 2 of; Tree T4 (TN17) (Dusk) 14/07/2021 Refer to Fig. 9.

Time (24 Hrs)	Surveyor	Species ¹⁰	No. bats	Bat Activity	Map Annotation
21:41	EM / KW	P.pip	1	HNS, Brief call	
21:45	EM / KW	P.pip	6	BC, BF, NWest along the tree line	A
21:56	EM / KW	P.pip	1	BC, Flew South and then headed NWest along the tree line	A
22:01	EM / KW	P.pip	1	BF, South of the tree line	
22:09	EM / KW	P.nat	1	BC, SWest to SEast along the tree line	B
22:13	EM / KW	P.pip	1	BC, SWest to SEast along the tree line then across the field	B
22:17	EM / KW	P.pip	1	BF, Circling above	D
22:19	EM / KW	Bat sp.	1	BF, Along the tree line – SNH	D
22:22	EM / KW	P.pip	1	BC, S East to S West along the tree line	A
22:24	EM / KW	P.pip	1	BF, Circling the field with occasional passes of faint calls	C
22:36	EM / KW	P.nat	1	HNS, Single pass	
22:45	EM / KW	Bat sp.	1	SNH, BC, S East to N West along the tree line	A
22:48	EM / KW	E.ser	1	HNS, Single pass	

¹⁰ P.nat – *Nathusius pipistrelle* (*Pipistrellus nathusii*); E.ser – *Serotine* (*Eptesicus serotinus*); Bat sp. – Unidentifiable bat species.

Figure 9: Survey 2: Tree T4 (TN17) – 14th July 2021 (Dusk) - Activity map.



Survey 2: Tree T1 – 21st July 2021 (Dusk).

Survey site: Gartree 2, Market Harborough (Tree T1). Surveyor positions: Facing tree.

Date: 21/07/2021.

Sunset/sunrise: 21:12.

Start: 20:57.

End: 22:42.

Weather conditions:

Start temperature: 32°C. Finish temperature: 20°C.

Precipitation 0, Wind strength 0/5, Cloud cover 1/8.

Humidity start: 68%. Humidity finish: 74%.

Surveyors: John Harvey (JH) & Reece Rockley (RR).

Equipment: EM Touch & iPad/iPhone.

Survey summary: Common pipistrelles foraging and commuting down the path and around the trees throughout the night. Occasional pass of noctules which locations were assumed commuting over the fields at height.

Incidental observations N/A.

Survey constraints: N/A.

Table 10 - All Bat Activity Recorded During Survey 1 of; Tree T1 on the 21/07/2021 Refer to Fig. 10.

Time (24 Hrs)	Surveyor	Species	No. bats	Bat Activity	Map Annotation
21:35-22:16	JH & RR	P.pip	Unknown	HNS, Constant foraging & commuting calls from the road, tree line and field areas	C
22:03	JH & RR	N.noc	1	HNS, Loud pass	A/B
22:30	JH & RR	P.pip	1	HNS, Brief pass	
22:37	RR	N.noc	1	HNS, Loud pass	A/B
22:41	RR	P.pip	1	HNS, Brief pass	

Figure 10: Survey 2: Tree T1 - 21st July 2021(Dusk) – Activity Map.

