

Tournerbury Wedding & Events Venue, Tournerbury Woods Estate, Tournerbury Lane, Hayling Island, Hampshire, PO11 9DL

Bat Survey Report

December 2020

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Bat Survey Report

**Tournerbury Wedding & Events Venue, Tournerbury Woods Estate, Tournerbury Lane,
Hayling Island, Hampshire, PO11 9DL**

for

Tournerbury Woods Estate

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This report represents sound industry practice; reports and recommends correctly, truthfully and objectively; is appropriate given the local site conditions, scope of works proposed and resources allocated to us by the client; and avoids invalid, biased, and exaggerated statements.

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EXECUTIVE SUMMARY

1. This report provides information from bat surveys carried out by Hampshire Ecological Services Ltd for Tournerbury Woods Estate in connection with an application for retrospective planning permission for a wedding & events venue at Tournerbury Wedding & Events Venue, Tournerbury Woods Estate, Tournerbury Lane, Hayling Island, Hampshire, PO11 9DL (approximate Ordnance Survey Grid Reference SZ731996). It is intended the data accompanies an Ecological Impact Assessment (EcIA) to assess that the mitigation measures proposed, particularly in relation to lighting, are proportional and sufficient to reduce impacts on bats.
2. The site consists of a mixture of semi-natural broadleaved woodland, broadleaved plantation woodland, secondary woodland, areas of amenity and semi improved grassland. Woods Cottage, outbuildings and other wedding venue buildings are located in the south-east corner of the site. The location of the site is shown in *Figures 1* and *2* and a plan of the site is shown in *Figure 3* (see *Section 6*).
3. An internal and external inspection of the Woods Cottage was carried out by licensed bat ecologist Nicola Pyle MCIEEM on the 14th June 2020.
4. Woods Cottage is a two-storey building with wooden cladding and a pitched slate roof. Internally, the roof void is uncluttered with wooden beams and ridge beam and lined with bitumen roof felt.
5. The mature trees, woodland, ponds, coastal mudflats and open areas provide good sheltered bat commuting routes and foraging habitat all over the site. These in turn connect the site to areas of high quality foraging habitat in the wider landscape.
6. Evidence of bats (droppings) and a pipistrelle bat were observed during the initial survey. The droppings, within the roof void of the cottage, were consistent in size, shape and texture with those of pipistrelle bats. The pipistrelle bat was observed under the bargeboard on the south-west elevation of the cottage. Therefore, Woods Cottage is a confirmed roost.
7. The indicative locations of the bat evidence (droppings) and the bat are illustrated in *Figure 4* in *Section 6*.
8. Three dusk emergence surveys, using three surveyors, were carried out on Woods Cottage on the 14th June, 28th July and 18th August 2020.
9. Seven activity transect surveys, using surveyors in pairs, were carried out on the site between the 24th June to 13th October 2020.
10. Bats were observed emerging and re-entering Woods Cottage and the results are summarised in the table below. There was a peak count of nine soprano pipistrelles, two common pipistrelles

and one pipistrelle species bat emerging from the building on any one survey. A plan summarising bat emergence and re-entry locations is given in *Figure 4.6.1* in *Section 4.6*.

Date	Species	No.	Emergence/ re-entry	Emergence/ re-entry locations
14/07/2020	Soprano pipistrelle	5	Emergence	Apex of the north-east gable
	Pipistrelle species	1	Emergence	A bargeboard on the south-west elevation
28/07/2020	Soprano pipistrelle	9	Emergence	Apex of the north-east gable
	Common pipistrelle	2	Emergence	A bargeboard on the south-west elevation
	Pipistrelle species	1	Emergence	Wooden cladding on the right side of the dormer on the south-east elevation
18/08/2020	Soprano pipistrelle	1	Re-entry	East corner of the roof
	Soprano pipistrelle	2	Re-entry	Apex of the north-east gable

11. The full data from the dusk emergence surveys is given in *Appendix C* and plans showing the foraging and commuting bats (observations only) are given in *Figures 5-7* in *Section 6*.
12. The full data from the activity transects is given in *Appendix D* and plans showing the foraging and commuting bats (observations only) are given in *Figures 8-14* in *Section 6*.
13. Edge or transitional habitats around the site are the location for the majority of the bat foraging and commuting activity including the edges of woodland, shoreline, openings in the canopy, rides/ tracks and grassland. During the activity transects, these areas generally experienced very low levels of disturbance from the wedding venue (area to the north of Woods Cottage in the south-east corner of the site) in regards to light pollution. However, lighting will have been present on site throughout its use as a venue and holiday cottage for the last 20+ years, particularly near Woods Cottage.
14. Based on the evidence from the internal/ external survey and the emergence surveys, Woods Cottage is an occasional non-breeding day roost for low numbers of common pipistrelles and soprano pipistrelles. Common pipistrelles, soprano pipistrelles and serotine bats were observed flying in the vicinity of Woods Cottage and foraging and commuting over the wider site during the emergence and activity transect surveys. No works are planned to Woods Cottage and it remains unaffected by the proposals.
15. To provide net gain in biodiversity, as required under the National Planning Policy Framework (NPPF), the site will be enhanced for bats using at least ten tree-mounted woodcrete/ woodstone or sturdy wooden bat boxes. These create secure crevices for bats as an opportunity for roosting, especially if located within the plantation woodland where the younger trees mean that there are likely to be fewer trees that have features that roosting bats could use.

16. Changes in lighting can affect foraging and roosting bats. This is because lighting can impact bat populations directly by disturbing roosts and reducing foraging area, or indirectly by severing commuting routes from roosts.
17. Any new external lighting should avoid spillage of greater than 1 lux onto the trees and woodland. The use of non-UV LED lighting (preferably using warm spectrum wavelengths) is strongly recommended to avoid the most deleterious impacts of lighting on biodiversity and bats in particular. Where lighting is necessary, downlighting/ hoods or similar devices should be used to allow the light to be directed onto where it is needed and avoid any light spill into the adjacent woodland. Alternatively, low-level lighting could be used instead.
18. No lighting should be directed onto roost exit points and retained vegetation (particularly the trees) around Woods Cottage to avoid and prevent light disturbance to existing bat populations.
19. This survey data is valid for a maximum of 12 months. Bats frequently move around and adopt new roosting sites, therefore if more than 12 months elapses it may be advisable to conduct further survey work to obtain up-to-date information, thereby ensuring protected species compliance.
20. According to the *Multi-Agency Geographic Information for the Countryside* website (www.magic.gov.uk), there has been one granted bat European Protected Species (EPS) licence within 2km of the site.

2 INTRODUCTION

2.1 General

This report provides information from bat surveys carried out by Hampshire Ecological Services Ltd for Tournbury Woods Estate in connection with an application for retrospective planning permission for a wedding & events venue at Tournbury Wedding & Events Venue, Tournbury Woods Estate, Tournbury Lane, Hayling Island, Hampshire, PO11 9DL (approximate Ordnance Survey Grid Reference SZ731996). The location of the site is shown in *Figures 1 and 2* in *Section 6*.

The following reports have already been compiled for this site;

- *Tournbury Woods Estate, Hayling Island, Hampshire. National Vegetation Classification Survey* (John Wenman Ecological consultancy LLP, 2014).
- *Tournbury Woods, The Tournbury Woods Estate, Tournbury Lane, Hampshire, PO11 9DL. Breeding Birds Survey Report* (Hampshire Ecological Services Ltd, 2015).
- *Tournbury Woods Estate, Tournbury Lane, Hayling Island, Hampshire, PO11 9DL. Updated Phase 1 Habitat Survey* (John Wenman Ecological Consultancy LLP, 2018).
- *Tournbury Woods Estate, Tournbury Lane, Hayling Island, Hampshire, PO11 9DL. Heronry Survey Report* (Hampshire Ecological Services Ltd, 2019).
- *Wedding & Event Venue, Tournbury Woods, Tournbury Woods Estate, Tournbury Lane, Hayling Island, Hampshire PO11 9DL. Shadow Habitat Regulations Assessment Report* (Hampshire Ecological Services Ltd, 2020).
- *Tournbury Wedding & Events Venue, Tournbury Woods, Tournbury Woods Estate, Tournbury Lane, Hayling Island, Hampshire PO11 9DL. Ecological Impact Assessment Report* (Hampshire Ecological Services Ltd, 2020).
- *Tournbury Wedding Venue. Shadow Appropriate Assessment* (Holbury Consultancy Services Ltd, 2020).

2.2 Site description

Tournbury Wood is a mixture of semi-natural broad-leaved woodland within Saxon earthworks with adjoining broad-leaved plantation woodland and secondary woodland (Tournbury plantation). There is a small area of improved grassland within the woodland.

In the south eastern corner of the site the woodland open out into amenity grassland around Woods Cottage. To the south-west, the woodland opens out into a small area of saltmarsh. Scattered scrub has established along the south eastern edge of the site.

The site is situated on the eastern side of Hayling Island on the northern side of the Mengham Rythe estuary. The woodland skirts the northern edge of the Mengham Rythe estuary and extends northwards with Tournbury Farm and Golf Course to the north; a small field used for cattle

grazing to the east; and agricultural fields that have been given over to horse paddock use to the west. The woodland at Tournerbury forms 19% of the total wooded habitat on Hayling Island.

The remainder of Hayling Island is predominantly agricultural/ horse paddocks with a medium size urban cluster formed along the southern coast and extending north along the main road. The majority of the coastland is either pebbled/sandy beaches or floodplain/marsh.

2.3 *Proposed activities*

The surveys were carried out in connection with an application for retrospective planning permission for a wedding & events venue at Tournerbury Woods Estate, Tournerbury Lane, Hayling Island, Hampshire, PO11 9DL.

2.4 *Current planning status*

Retrospective planning permission has been applied for at this site.

2.5 *Objectives of the surveys and report*

The surveys by Hampshire Ecological Services Ltd included internal and external inspections of Woods Cottage to identify bat roost suitability and to systematically search for bats and evidence of bats. Subsequently, three dusk emergence surveys were carried out. In addition, monthly transects were walked. The aim was to identify if bats were present or likely to use the site for roosting, as well as identify what bats were using the site for commuting and/ or foraging.

The surveys and the report writing were carried out in accordance with *Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd edition* (Collins, 2016). Any deviations from the guidelines are justified in the relevant sections.

Additionally, all ecological surveys should be completed in line with Natural England's *Standing Advice for Local Authorities*

(<http://www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/advice.aspx>), which states:

- Natural England will not comment on applications that are submitted without the relevant protected species surveys if there are no other issues (i.e. in relation to SSSIs or landscape).
- Natural England will not comment on scoping surveys that recommend further surveys where these have not been undertaken and submitted with the scoping reports.

2.6 *Structure of this report*

This report is structured as follows:

- *Section 1* contains the executive summary;
- *Section 2* contains an introduction;
- *Section 3* describes the survey methods;
- *Section 4* describes the results;
- *Section 5* evaluates the findings;
- *Section 6* contains the figures including:
 - *Figure 1* gives aerial photographs showing the site location;
 - *Figure 2* gives an Ordnance Survey map showing the location of the site;
 - *Figure 3* gives a site plan showing the building surveyed and bat activity transect route;
 - *Figure 4* gives a site plan showing bat evidence on the site;
 - *Figures 5-7* illustrate the bat activity recorded during the dusk emergence surveys; and
 - *Figures 8-14* illustrate the bat activity recorded during the bat activity transect surveys.
- *Section 7* lists the references;
- *Appendix A* gives information on relevant legislation;
- *Appendix B* gives information on bat ecology;
- *Appendix C* gives the data from the dusk emergence surveys; and
- *Appendix D* gives the data from the bat activity transect surveys.

3 **METHODS**

3.1 **Desk study**

The *Multi-Agency Geographic Information for the Countryside* website (www.magic.gov.uk) was used to search for granted European Protected Species (EPS) licences in relation to bats within 2km of the site.

3.2 **Field survey**

3.2.1 *Dates, times and weather*

An external and internal inspection of the building was conducted during the daytime on the 14th June 2020, prior to the first dusk emergence survey.

Subsequently, three dusk emergence surveys and seven bat activity transect surveys were carried out. Details of the weather, air temperature and times of these surveys are given in *Tables 3.2.1.1.* and *3.2.1.2.*

Table 3.2.1.1. Weather conditions during the dusk emergence surveys.

Date	Start time	End time	Sunset/ sunrise	Temperature at start & end (°C)	Wind (Beaufort scale)	Cloud Cover (%)
14/06/2020	20:57	22:44	21:12	17.0 – 16.4	1-2	100
28/07/2020	20:44	22:25	21:55	17.2 – 15.7	2-3	0
18/08/2020	20:03	21:48	20:18	20.0 – 18.7	0-1	0-5

The emergence surveys commenced fifteen minutes before sunset and continued for an hour and a half after sunset (long after bats would have exited). The weather was suitable for bat emergence and foraging during all the surveys.

Table 3.2.1.2. Weather conditions during the bat activity transect surveys.

Date	Start time	End time	Sunset/ sunrise	Temperature at start & end (°C)	Wind (Beaufort scale)	Cloud Cover (%)
24/06/2020	21:27	22:57	21:23	21.5 – 20.0	0	0
08/07/2020	21:19	22:57	21:17	17.7 – 16.9	0	100
22/07/2020	21:03	23:07	21:03	19.0 – 17.0	0	20
07/08/2020	04:11	05:28	05:40	17.4 – 16.0	0	0
20/08/2020	20:00	21:17	20:14	19.0 – 19.0	0	75
03/09/2020	19:44	20:58	19:44	17.4 – 16.0	0	0
13/10/2020	18:15	19:38	18:17	13.0 – 13.0	0	100

The survey commenced around sunset and continued for approximately an hour and a half after sunset or at least an hour and a half before sunrise. One circuit of the transect route was undertaken during each survey. Each survey alternated between walking the transect route forwards from listening point 1 to 15 and in reverse, from listening point 15 to 1. The weather was suitable for bat foraging on all occasions.

3.2.2 Personnel

The initial survey was carried out by Nicola Pyle MCIEEM who is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) with over 13 years of experience in ecological consultancy. She holds a Natural England licence allowing the disturbance and handling of bats for the purposes of survey in all counties of England (current Bat Class Licence Registration number 2015-18259-CLS-CLS).

Personnel carrying out the dusk emergence and bat activity transect surveys are given in *Tables 3.2.2.1* and *3.2.2.2*. All surveyors are experienced in carrying out bat surveys using detectors.

Table 3.2.2.1. Personnel carrying out the dusk emergence surveys.

Date	Personnel		
14/07/2020	Nicola Pyle MCIEEM	Calum Cooper BSc (Hons) GradCIEEM	Darla Brown
28/07/2020	Nicola Pyle MCIEEM	Calum Cooper BSc (Hons) GradCIEEM	Darla Brown
18/08/2020	Calum Cooper BSc (Hons) GradCIEEM	Andrew Lomas MSc	Darla Brown

Table 3.2.2.2. Personnel carrying out the activity transect surveys

Date	Personnel	
24/06/2020	Nicola Pyle MCIEEM	Calum Cooper BSc (Hons) GradCIEEM
08/07/2020	Calum Cooper BSc (Hons) GradCIEEM	Darla Brown
22/07/2020	Nicola Pyle MCIEEM	Darla Brown
07/08/2020	Calum Cooper BSc (Hons) GradCIEEM	Darla Brown
20/08/2020	Calum Cooper BSc (Hons) GradCIEEM	Darla Brown
03/09/2020	Calum Cooper BSc (Hons) GradCIEEM	Darla Brown
13/10/2020	Calum Cooper BSc (Hons) GradCIEEM	Darla Brown

This report was reviewed by John Poland CEnv MCIEEM CBiol MSB, who is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM), a Chartered Environmentalist (CEnv), a Chartered Biologist (CBiol) and multi-species licence holder with 20 years of experience in ecological consultancy and Victoria Russell MCIEEM who is a full member of the CIEEM and multi-species licence holder with over 23 years of experience in ecological consultancy.

All staff adhere to the Chartered Institute of Ecology and Environmental Management's (CIEEM) *Code of Professional Conduct*.

3.2.3 Assessment of current bat roost suitability

Because bats are crevice-dwelling mammals it is often difficult to thoroughly inspect buildings for bats and evidence of bats without a destructive search, which is not generally practical or acceptable. Examples are where bats roost between the roofing felt and tiles or slates, around window frames and behind bargeboards. These areas cannot be inspected, but a surveyor would know that bats might roost here because there are places where bats could gain entry. A pipistrelle bat is small enough to fit into a match box and can roost in gaps just 14-20mm wide.

The building was assessed for its **bat roost suitability** according to the following factors that influence the likelihood of bat roosting:

- Surrounding habitat: whether there are potential flight-lines and bat foraging areas nearby.
- Construction detail: the type and construction of architectural features such as attics, bargeboards, soffit boxes, lead-flashing, cavity walls and hanging tiles that could be used by roosting bats. Some construction details and materials are more favourable to bat occupation than others.
- Building condition: whether the building has no roof or has a sound roof without any potential bat access points.
- Internal conditions: bats favour sheltered locations with a stable temperature regime, protection from the elements and little wind/light/rain penetration.
- Potential bat access points: whether there is flight and crawl access.
- Potential roosting locations: the presence of bat-accessible voids, cracks and crevices.

The risk of bat roosts being present will be lower where structures have:

- Urban setting with little greenspace.
- Heavy disturbance.
- Small, cluttered roof void (particularly for brown long-eared bats).
- Modern construction with few gaps or crevices that bats can fly or crawl through (although pipistrelles may still be present).
- Prefabricated steel or sheet materials.
- Active industrial premises.

The above list provides generic criteria and there are exceptions to consider. For example, pipistrelle roost sites are often found in modern housing estates and therefore the absence of bats from such locations should not always be assumed.

Some information on bat ecology is included in *Appendix B*.

3.2.4 *Systematic inspection for bats or evidence of bats*

The buildings was assessed for its suitability to support roosting bats using the following access and inspection equipment: high-quality 10x42 binoculars; a 1,000,000 candlepower Clulite™ CB2 torch; an LED pen torch; an Explorer Premium™ wireless inspection camera with recordable monitor; and a 3.8m surveyors' ladder. Binoculars were employed to view higher areas such as potential access points on the outside of the building. A description of the building was recorded on a survey sheet and digital photographs were taken as a permanent record.

Visual, systematic examinations were made for bats and evidence of bats in the building, both internally and externally, of the following:

- roof beams, especially the ridge beam;
- cracks, crevices and sheltered voids;
- the floors and stored items;
- external features such as cracks and holes in the walls;
- wall and door surfaces;
- window and door frames; and
- wall bases.

Evidence of roosting bats includes droppings, feeding remains and dead bats, but also staining from urine and fur-oils, scratch marks, odour, the presence of bat-fly (Nycteribiid) pupal cases, and in some cases, the absence of cobwebs.

Bat droppings can prove beyond doubt that bats use a building and can help to identify roosting locations because piles often accumulate beneath roosting sites or entrance points. The location, size, shape, texture and colour of the droppings can be used to aid species identification. DNA analysis of droppings is also possible and samples are taken where necessary. The number and condition (age) of droppings can indicate the size of the roost and when it was last used.

Following the internal and external inspections, the building was assigned a level of suitability for being used by roosting bats. This was based on the criteria in *Table 3.2.4.1* (Collins, 2016).

Table 3.2.4.1. Bat Roost Suitability.

Suitability	Description of roosting habitats	Description of commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats	Negligible habitat features on site likely to be used by commuting or foraging bats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (<i>i.e.</i> unlikely to be suitable for maternity or hibernation).	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, <i>i.e.</i> 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) or a patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only)	Continuous habitat connected to the wider landscape that could be used by bats for commuting, 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.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats 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. The site is close to and connected to known roosts.

3.2.5 Dusk emergence surveys

The dusk emergence surveys followed standard survey protocol in *Bat Surveys – Good Practice Guidelines, 3rd edition* (Collins, 2016).

The surveyors were located with good views of the potential bat access points identified during the initial site visit. The timing of the visits, from early evening until after dark and early morning until light, was aimed at detecting active bats in the vicinity. When it was too dark for visual observation, electronic bat detectors were used to listen for the ultrasonic sounds produced by bats either flying in the vicinity or emerging from the building.

The surveyors recorded all bat activity encountered, but particular attention was focused on any bats emerging or re-entering. The results were documented by noting the time, bat species and behaviour (e.g. commuting, foraging, social interaction *etc.*). The surveyors were in constant contact via hand-held radios so that information could be easily exchanged regarding bat activity. The time between all surveyors' devices was synchronised so time data was recorded precisely.

Bat detectors are used so that surveyors can identify most bat species in the field, using the heterodyne output in combination with bat shape, flight pattern and behaviour. Surveyors were equipped with BatBox Duet™ detectors connected to solid-state recorders (Edirol Roland-05) were employed to record bat calls for later sonogram analysis using BatSound™ computer software (should it be required). Frequency-division, whereby the ultrasound is divided by 10 into an audible range, has a considerable advantage over time-expansion for survey work as it allows recordings to be taken in real time. This ensures that all bat activity is recorded. An Echo Meter Touch 2™ was also used for rapid real-time analysis.

Queried recordings were later replayed and analysed through BatSound™ software to ensure that any activity accidentally missed during the survey was recorded and times and location calculated. The species of bat was confirmed at this stage where possible. Bat detector surveys provide one of the most effective methods of identifying bat species and activity patterns. However, it is not always possible to identify bats down to species level, even with subsequent sound analysis.

3.2.6 Bat activity transect surveys

Foraging and commuting activity was recorded during transects surveys following the standard survey protocol in *Bat Surveys – Good Practice Guidelines, 3rd edition* (Bat Conservation Trust, 2016). The predetermined transect route was designed to give coverage of the site. It was combined with point surveys whereby surveyors stop at designated listening stations along the transect route and record all the bat activity observed over an approximate five minute period.

The surveyors recorded all bat activity encountered along the transect route but particular attention was focused on bats encountered at listening stations. The results were documented by noting the time, bat species and behaviour (e.g. commuting, foraging, social calling *etc.*). Any observed bat activity (such as commuting) was also recorded on a site plan. In addition, any bats observed or heard on the walk between listening stations were recorded and plotted where seen.

The timing of the surveys was aimed at detecting active bats in the vicinity of the transect. Electronic bat detectors were used to listen for the ultrasonic sounds produced by bats flying in the vicinity; particularly once darkness reduced the effectiveness of visual observation.

Bat detectors are used so that surveyors can identify most bat species in the field, using the heterodyne output in combination with bat shape, flight pattern and behaviour. Frequency-division, whereby the ultrasound is divided by 10 into an audible range, has a considerable advantage over time-expansion for survey work as it allows recordings to be taken in real time. This ensures that all bat activity is recorded.

Bat detector surveys provide one of the most effective methods of identifying bat species and activity patterns. However, it is not always possible to identify bats down to species level even with subsequent sound analysis.

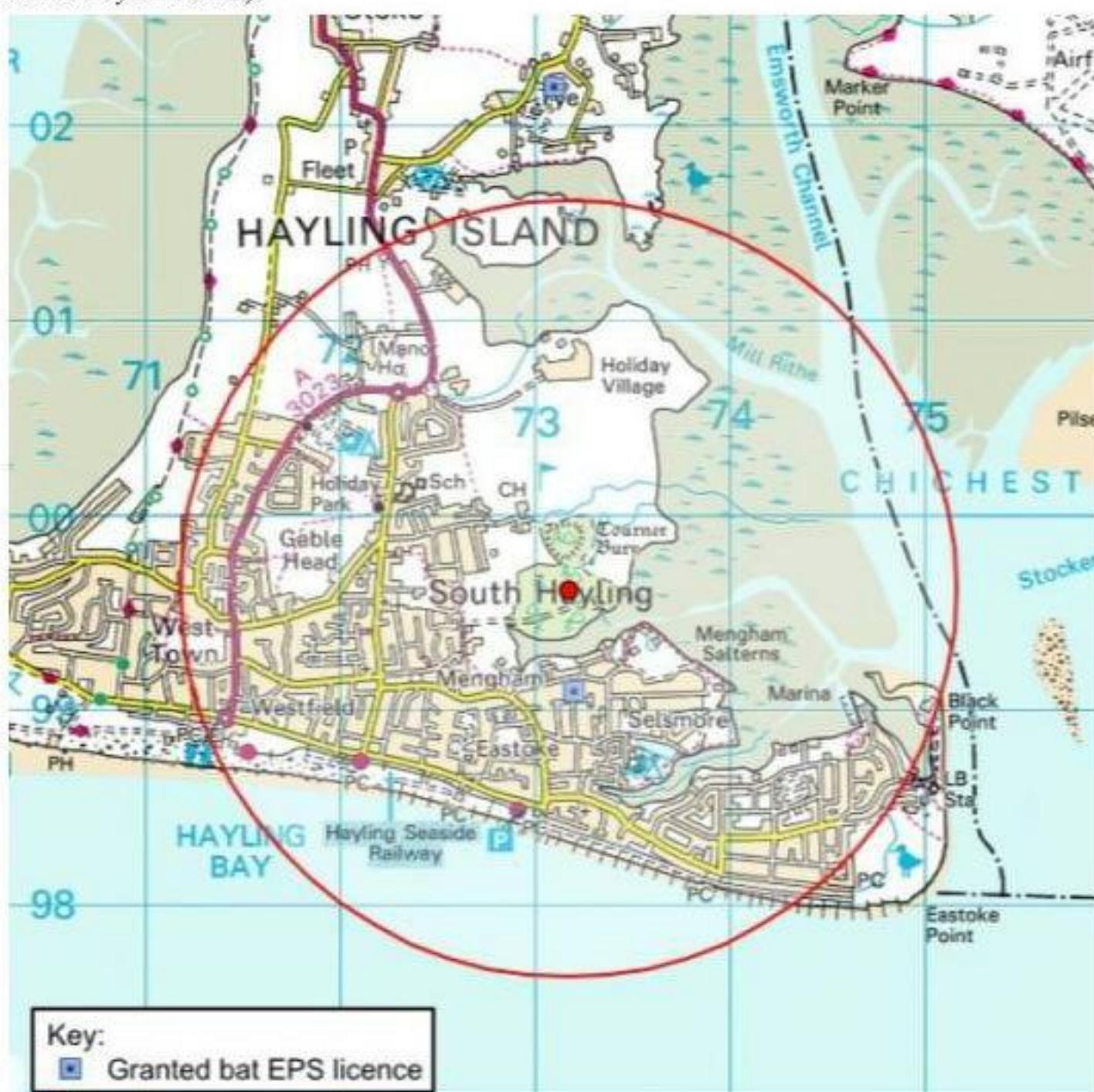
RESULTS**4.1 Desk study**

According to the *Multi-Agency Geographic Information for the Countryside* website (www.magic.gov.uk), there has been one bat European Protected Species (EPS) licence granted within 2km of the site. This is detailed in *Table 4.1.1.1* and its location is shown in *Figure 4.1.1.1*.

Table 4.1.1.1. Granted European Protected Species (EPS) licences within 2km of the site.

Species subject of licence	Type of habitat affected	Date licence was granted	Distance & direction from site
Common pipistrelle & soprano pipistrelle	Resting place	21/07/2017	c.480m south

Figure 4.1.2.1. Location of sites with granted bat EPS licences within 2km of the site (site location marked by a red dot).



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4.2 *Survey of building*

The construction details and photographs of the building are summarised in *Table 4.2.1*.

Table 4.2.1. Summary of the buildings construction details.

Type/Name	Woods Cottage	
Description	A two-storey brick and rendered building with a pitched slate roof.	
No. of storeys	2	
Roof type	Pitched	
Roof cladding	Slate	
Ridge	Tile	
Wall type	Rendered	
Exterior	Wooden cladding (north-west elevation), bargeboards (north-east & south-west elevations), dormers, chimney.	
Photos	North-east elevation	South-east elevation
		
	North-west elevation	South-west elevation
		
Building dimensions	c. 10m wide x c. 14m long	
Roof void description	Uncluttered and floor lined with fibreglass insulation	
		
Frame	Wooden beams with ridge beam	

Roof lining	Bitumen roofing felt	
Roof void dimensions	c. 10m wide x c. 14m long	
Roof void height	c. 1.5m	
Potential roosting locations	Against the ridge beam and between the roof tiles and the internal lining. 	Under the bargeboards 
Bat evidence	Yes, pipistrelle bat observed under bargeboard on the south-west elevation and pipistrelle droppings within the roof void. 	
Bat suitability	Confirmed roost	

The majority of the roof appears well-sealed and in good condition. However, there are several potential bat access points into the roof at the gable ends, under the bargeboards and soffits, as well as some exterior features that also provide potential roosting locations for bats such as a wooden cladding.

Due to the presence of these potential access points, and suitable roosting locations, the building is classed as having high suitability to be used by roosting bats, following the criteria in *Table 3.2.4.1.*

4.3 *Commuting and foraging habitat*

The mature trees, woodland, ponds and open areas provide good bat commuting routes and foraging habitat all over the site. These in turn connect the site to other areas of high quality foraging habitat in the wider landscape.

Bats follow linear landscape features such as lines of trees, hedges, buildings and waterways in order to commute from their roost sites to their feeding grounds. Likewise they use these features to navigate between feeding areas and alternative roosts.

4.4 *Evidence of bats in Woods Cottage*

Evidence of bats, droppings and an individual pipistrelle bat were observed during the initial survey. The droppings, within the roof void of the cottage, were consistent in size, shape and texture with those of pipistrelle bats. In addition, a pipistrelle bat was observed under the bargeboard on the south-west elevation of the cottage. Therefore, Woods Cottage is a confirmed bat roost. This was reinforced by the emergences and re-entries from the building during the dusk surveys. The indicative locations of the bat evidence (droppings) and bat are illustrated in *Figure 4* in *Section 6*.

As there are three species of pipistrelle bat (common, soprano and Nathusius's), DNA analysis of the bat droppings is often carried to confirm identification. A sample of droppings was taken from each of the two locations of bat droppings within the roof void. However, as common and soprano pipistrelles were observed emerging from the building during the dusk surveys, DNA analysis is not required.

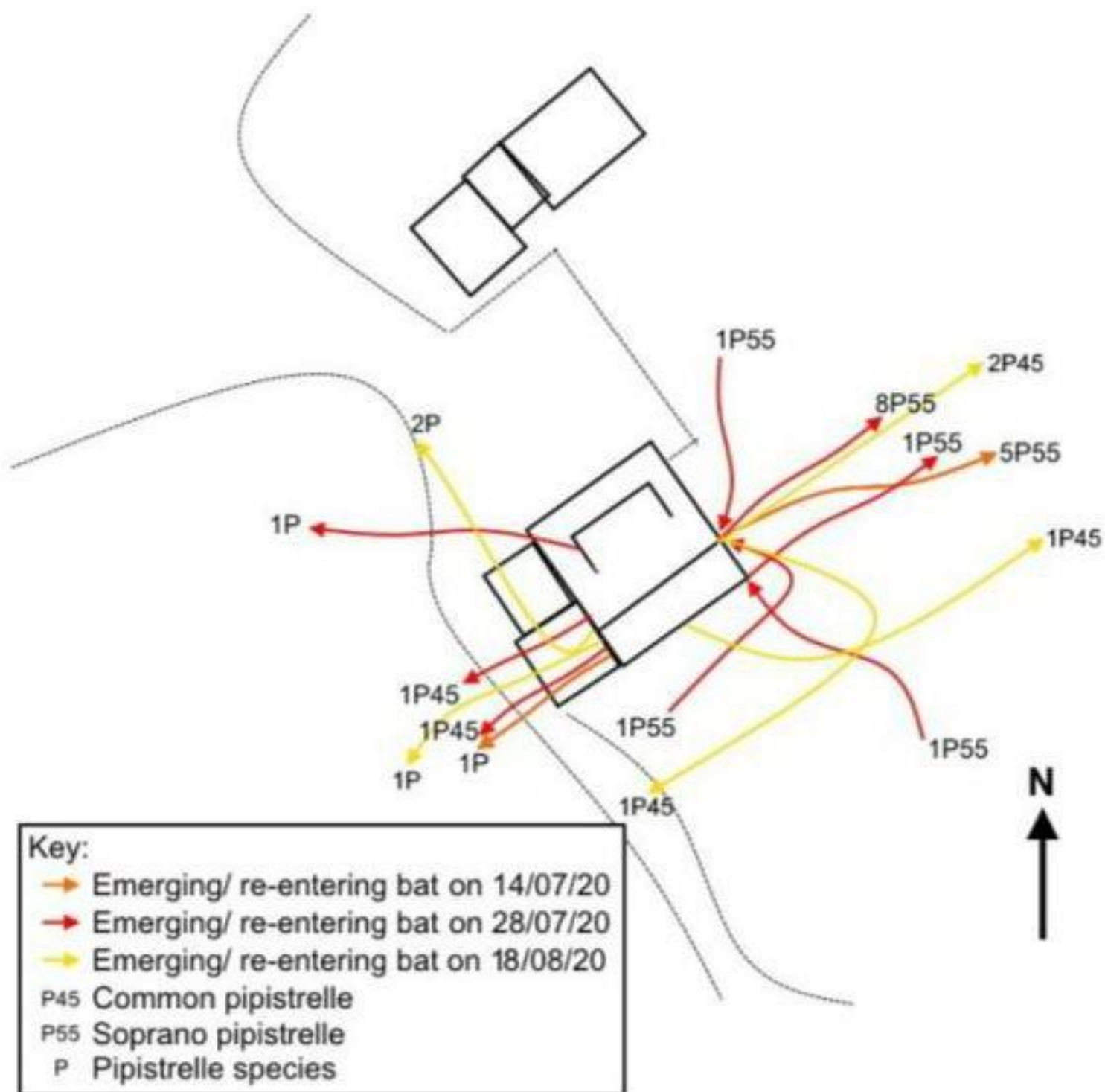
4.5 *Dusk emergence surveys*

Bats were observed emerging from and re-entering the building during the dusk emergence surveys. The results are summarised in *Table 4.5.1* and *Figure 4.5.1*.

Table 4.5.1. Summary of bats emerging and re-entering Woods Cottage during the surveys.

Date	Species	Number	Emergence/ re-entry	Emergence/ re-entry locations
14/07/2020	Soprano pipistrelle	5	Emergence	Apex of the north-east gable
	Pipistrelle species	1	Emergence	A bargeboard on the south-west elevation
28/07/2020	Soprano pipistrelle	9	Emergence	Apex of the north-east gable
	Common pipistrelle	2	Emergence	A bargeboard on the south-west elevation
	Pipistrelle species	1	Emergence	Wooden cladding on the right side of the dormer on the south-east elevation
18/08/2020	Soprano pipistrelle	1	Re-entry	East corner of the roof
	Soprano pipistrelle	2	Re-entry	Apex of the north-east gable

Figure 4.6.1. Summary plan of bats emerging and re-entering Woods Cottage during the dusk emergence surveys.



Common pipistrelles and soprano pipistrelles were observed flying in the vicinity of the building and on the site indicating the weather was suitable for bat activity on all occasions. The full data from the dusk emergence surveys is given in *Appendix C* and plans illustrating the bat activity (observations only) during the surveys are given in *Figures 5-7* in *Section 6*.

4.6 Bat activity transect surveys

Common pipistrelles, soprano pipistrelles and serotine bats were recorded commuting and foraging on and around the edges of the site during the bat activity transect surveys. In particular, they were foraging along the woodland edge at the south-east, south-west and north boundaries of the site. Limited bat activity was recorded at the centre of the site, within the plantation woodland.

The data from the bat activity transect surveys are given in *Appendix D* and plans illustrating bat activity during the surveys is given in *Figures 8-14* in *Section 6*.

5 ***INTERPRETATION AND EVALUATION***

5.1 ***Constraints on survey data***

The activity transects were not commissioned until June. To compensate for missing April and May, additional surveys were carried out during the peak survey season to give as much information as possible.

5.2 ***Potential impacts of the proposed development on bat roosts***

5.2.1 ***General***

According to the Multi-Agency Geographic Information for the Countryside website (www.magic.gov.uk), there has been one bat European Protected Species (EPS) licence granted within 2km of the site. It is unlikely that the current proposals will impact the same bat populations.

5.2.2 ***Commuting and foraging bats***

Common pipistrelles, soprano pipistrelles and serotine bats were recorded commuting and foraging on and around the edges of the site during the bat activity transect surveys. In particular, they were foraging along the woodland edge at the south-east, south-west and north boundaries of the site.

Edge or transitional habitats around the site are the location for the majority of the bat foraging and commuting activity. These include the edges of woodland, shoreline, openings in the canopy, rides/tracks and grassland. During the activity transects these areas generally experienced very low levels of disturbance from the wedding and events venue (area to the north of Woods Cottage in the south-east corner of the site) in regards to light pollution. Lighting will have been present on site throughout its use for the last 20 years, particularly around the vicinity of Woods Cottage. Lighting has increased slightly during the site's use as a wedding and events location.

There is good foraging habitat for bats on the site including mature trees, woodland, ponds and coastal mudflats. These in turn connect the site to areas of high quality foraging habitat in the wider landscape. Woodland and waterbodies provide high quality foraging habitat for a number of different species of bat. These areas will be unaffected and all links will be maintained. The connectivity around the edges of the site will be retained and as such no impact to commuting and foraging bats (and hence bat populations in the local area) is anticipated.

Changes in lighting can affect foraging and roosting bats. Therefore, no new lighting should be directed onto where bats emerge from the roosts in Woods Cottage or retained vegetation (particularly the trees and woodland).

Any lighting installed should avoid spillage of greater than 1 lux onto where bats emerge from the roosts in Woods Cottage and vegetation, particularly the ancient woodland. The use of non-UV

LED lighting (preferably using warm spectrum wavelengths) is strongly recommended to avoid the most deleterious impacts of lighting on biodiversity and bats in particular.

5.2.3 *Woods Cottage*

Due to the number of suitable roosting features (*e.g.* lifted roof tiles and gaps in wooden cladding) the building has high bat roost suitability. This was confirmed by bat droppings in the roof void and a pipistrelle bat under a bargeboard on the south-west elevation. Therefore, the building is a confirmed roost.

There was a peak count of nine soprano pipistrelles, two common pipistrelles and one pipistrelle species bat emerging from the building on any one survey. The level of usage shows that Woods Cottage is an occasional, non-breeding day roost for low numbers of common pipistrelles and soprano pipistrelles.

There are no proposals for works to Woods Cottage; therefore, no impacts to the roosts are anticipated.

Changes in lighting can affect roosting bats. Therefore, no new lighting should be directed onto where bats emerge from the roosts in Woods Cottage.

Any new lighting installed should avoid spillage of greater than 1 lux onto where bats emerge from the roosts in Woods Cottage. The use of non-UV LED lighting (preferably using warm spectrum wavelengths) is strongly recommended to avoid the most deleterious impacts of lighting on biodiversity and bats in particular.

Any future works to Woods Cottage will need update surveys and a Natural England bat EPS licence.

5.3 *Alternative roosting potential*

There are buildings nearby that could provide alternative roosting for bats (see *Figure 1* in *Section 6*). In addition, there are several mature trees in the vicinity of Woods Cottage that could provide bat roosting opportunities.

5.4 *Survey report expiry*

This survey data is valid for a maximum of 12 months. Bats frequently move around and adopt new roosting sites, therefore if more than 12 months elapses it may be advisable to conduct further survey work to obtain up-to-date information to advise work, thereby ensuring protected species compliance.

5.5 *Further survey*

No further surveys are proposed.

5.6 *Outline enhancement measures*

To provide net gain in biodiversity, as required under the National Planning Policy Framework (NPPF), the site will be enhanced for bats using at least ten tree mounted woodcrete/ woodstone or sturdy wooden bat boxes. These create secure crevices for bats as an opportunity for roosting, especially in the plantation woodland where the younger trees mean that there are likely to be fewer trees that have features that roosting bats could use.

No lighting should be directed onto roost exit points and retained vegetation (particularly the trees) and any new lighting installed should avoid spillage of greater than 1 lux near to or directly onto the vegetation so that light disturbance is not a problem. This is because lighting can impact bat populations directly by disturbing roosts and reducing foraging area, or indirectly by severing commuting routes from roosts. Therefore, the following (modified from *Bats and lighting in the UK* (ILP 2018)) should be undertaken:

- **Aim of light** The light should be aimed to illuminate only the immediate area required by using as sharp a downward angle as possible. A shield or hood can be used to control or restrict the area to be lit. Avoid illuminating at a wider angle as this will be more disturbing to foraging and commuting bats, as well as people and other wildlife.

For any new security lighting, the following should also apply:

- **Power** It is rarely necessary to use a lamp of greater than 2000 lumens (150W) in security lights. The use of a higher power is not as effective for the intended function and will be more disturbing for bats.
- **Movement sensors** Many security lights are fitted with movement sensors which, if well installed and aimed, will reduce the amount of time a light is on each night. This is more easily achieved in a system where the light unit and the movement sensor are able to be separately aimed.
- **Timers** If new lights are fitted with a timer this should be adjusted to the minimum to reduce the amount of 'lit time'.
- **Alternatives** The requirement for security lighting in each instance should be carefully considered and only used where absolutely necessary to deter crime or for health and safety of guests.

Any external lighting should avoid spillage of greater than 1 lux onto the trees and woodland, where possible. The use of non-UV LED lighting (preferably using warm spectrum wavelengths) is strongly recommended to avoid the most deleterious impacts of lighting on biodiversity and bats in particular.

Where lighting is necessary, down lighting/ hoods or similar devices should be used to allow the light to be directed onto where it is needed and avoid, where possible, light spill into the adjacent woodland. Alternatively, low-level lighting could be used instead.

5.7 *Requirement for Habitats Regulations licence – European Protected Species (EPS) licence*

A bat EPS licence or Bat Mitigation Class (formerly Bat Low Impact Class Licence) site registration from Natural England is not currently needed. However, it will be necessary if any future work is undertaken on the roof, bargeboards and wooden cladding of Woods Cottage.

A Natural England licence permits activities that may otherwise be offences under the *Conservation of Habitats & Species Regulations 2017*, such as the destruction of roost sites.

Evidence is required from emergence/ re-entry surveys during the bat active season between May and September in order to gather enough information about bat populations (including species, numbers and status of roost sites) to support a bat licence application.

Survey data supporting licence applications must be up-to-date *i.e.* have been conducted within the current or most recent optimal survey season (May to September). Therefore, if surveys show bats are present and licensable work is delayed until, during or after the next survey season, updated survey(s) will be required to support an application.

Natural England takes a minimum of 30 working days to process licence applications following receipt of all the relevant documentation. This includes an application form and a Method Statement. This includes a detailed mitigation strategy to eliminate or reduce impacts on bats.

It is not possible to apply for a licence until full planning permission has been granted and any conditions relating to wildlife fulfilled, although Local Planning Authorities usually request the information prior to determining a planning application request. Additional time will be required where any revisions to a proposed mitigation strategy are necessary to obtain the licence.

Figure 1. Aerial photographs showing the location of the site.



Figure 2. An Ordnance Survey map showing the site location, as indicated by the red boundary and the green arrow.



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Figure 3. Plan of the site with the building surveyed highlighted in red and the bat activity transect route marked in orange.



Figure 4. Plan showing the location of bat evidence on the site.

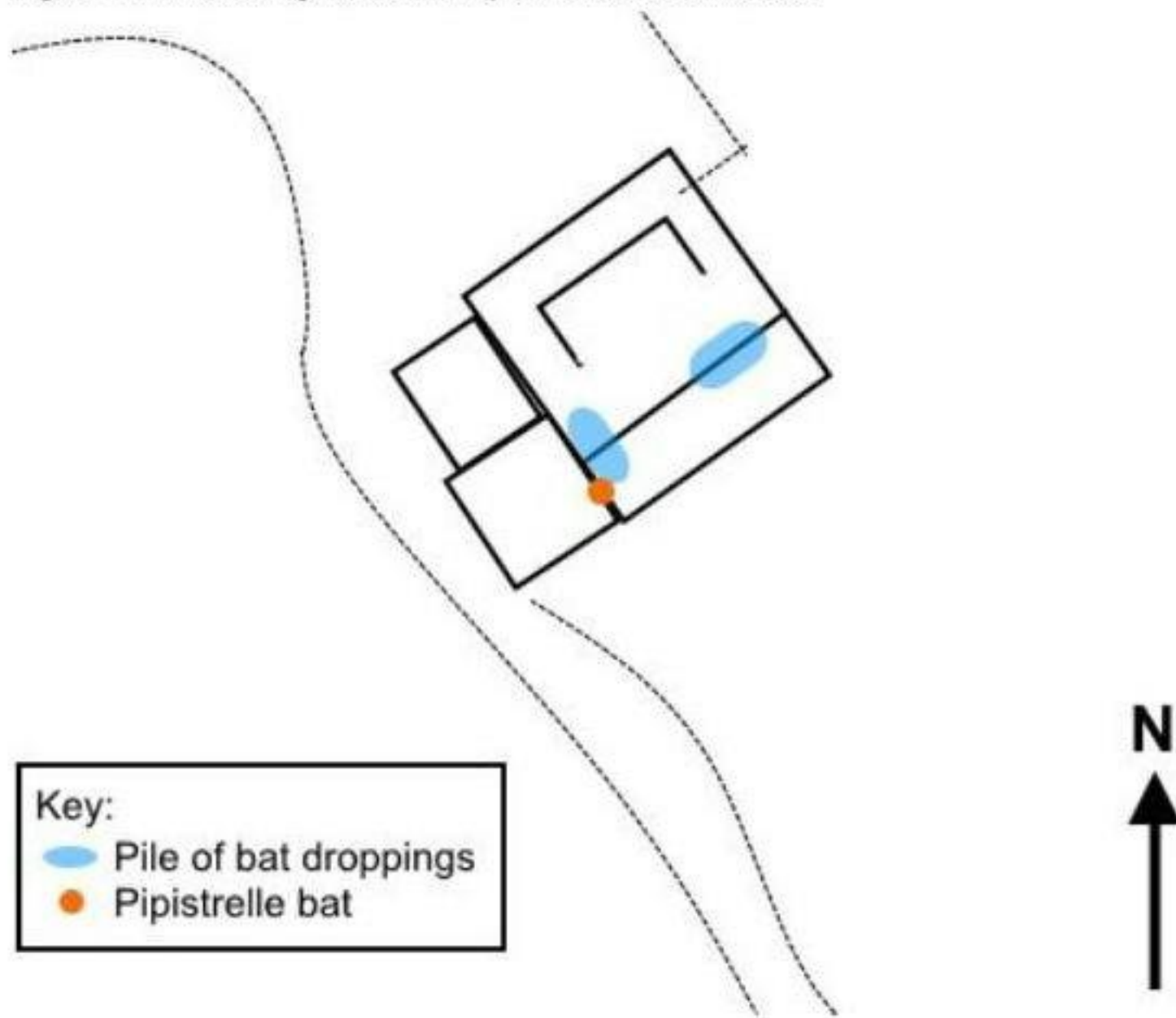


Figure 5. Plan showing bat activity (observations only) for the dusk emergence survey carried out on the 14th July 2020. Arrows show direction of flight (where known).

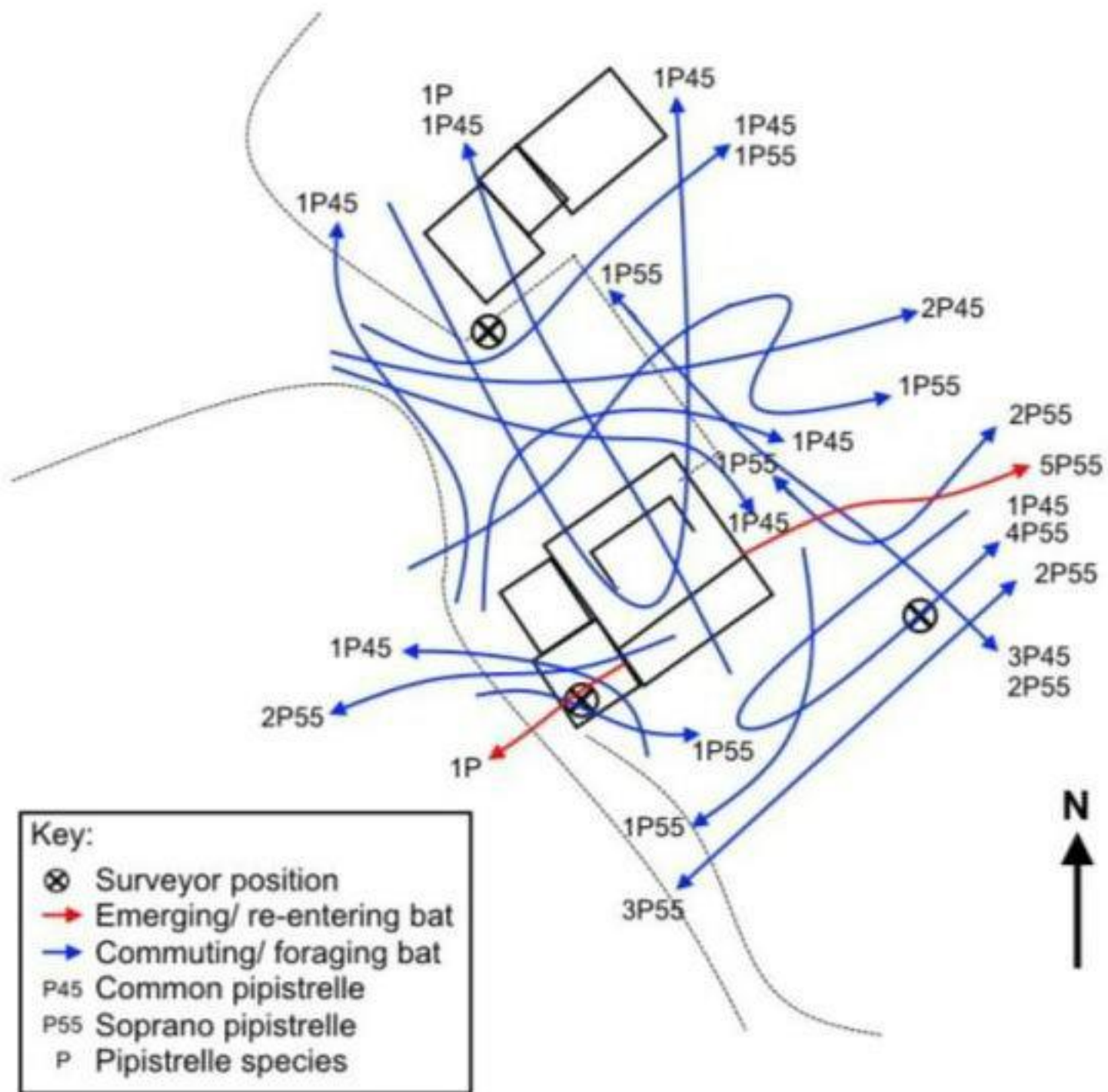


Figure 6. Plan showing bat activity (observations only) for the dusk emergence survey carried out on the 28th July 2020. Arrows show direction of flight (where known).

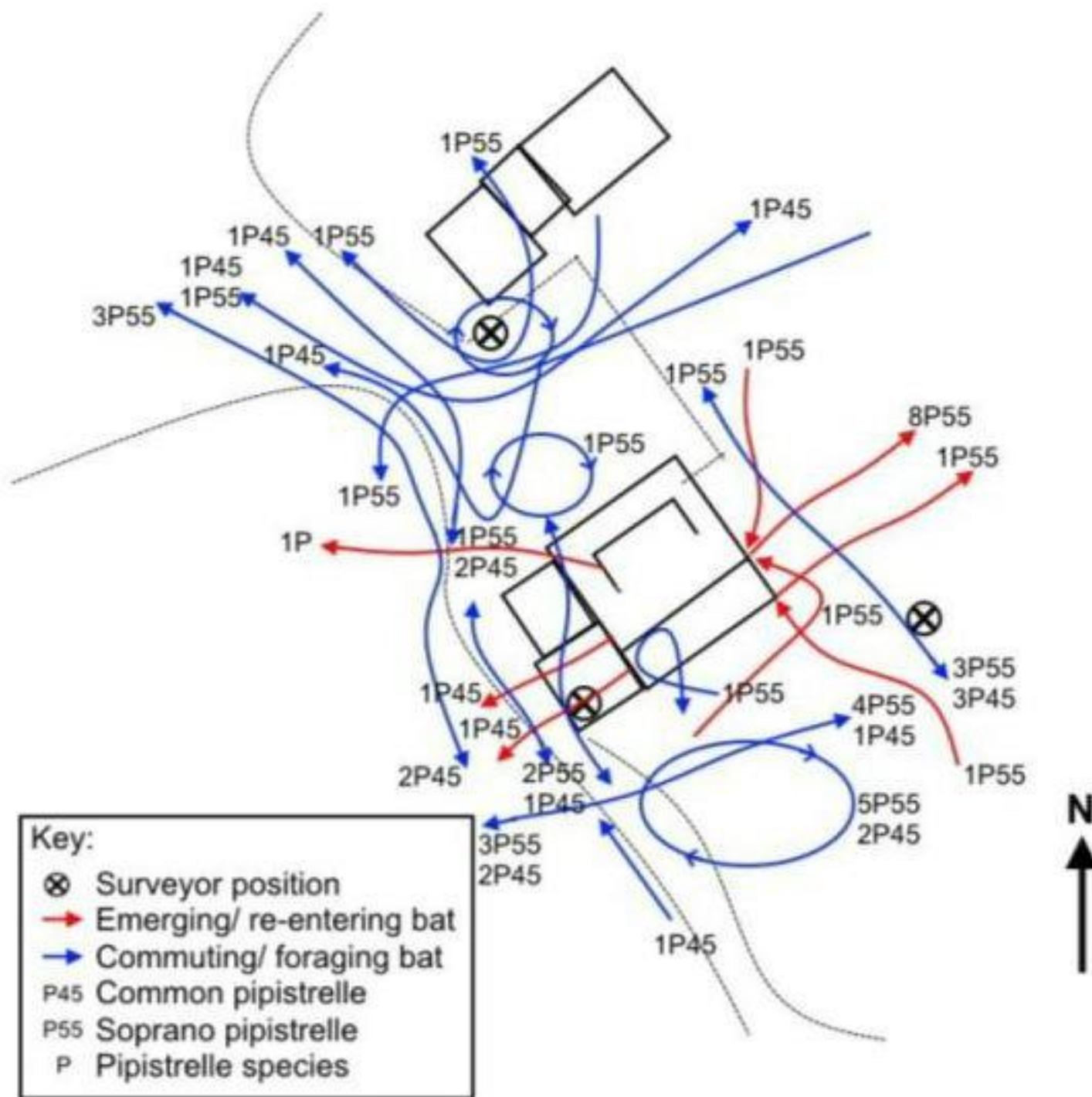


Figure 7. Plan showing bat activity (observations only) for the dusk emergence survey carried out on the 18th August 2020. Arrows show direction of flight (where known).

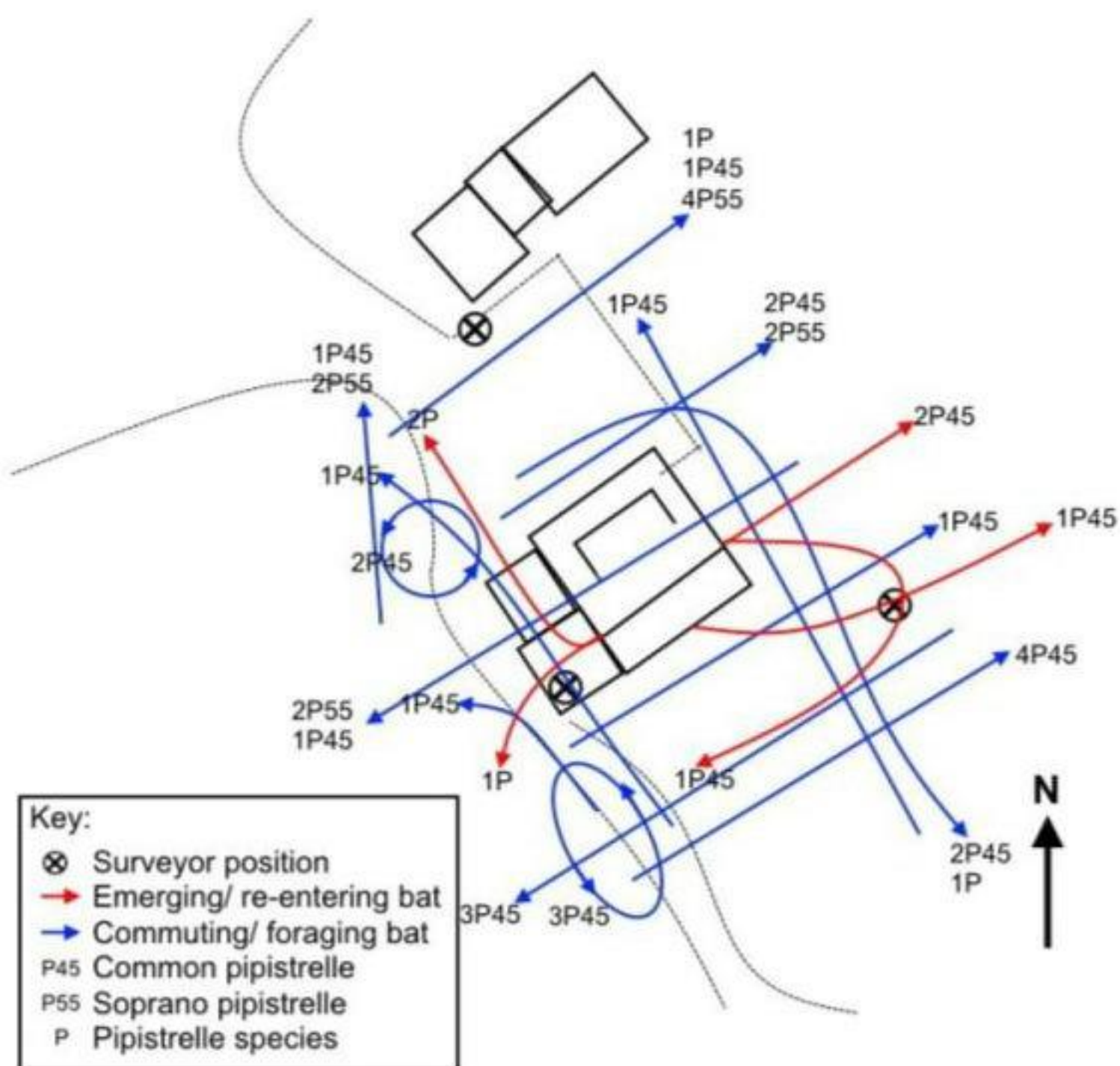


Figure 8. Plan showing bat activity (observations only) for the activity transect survey carried out on the 24th June 2020. Arrows show direction of flight (where known).

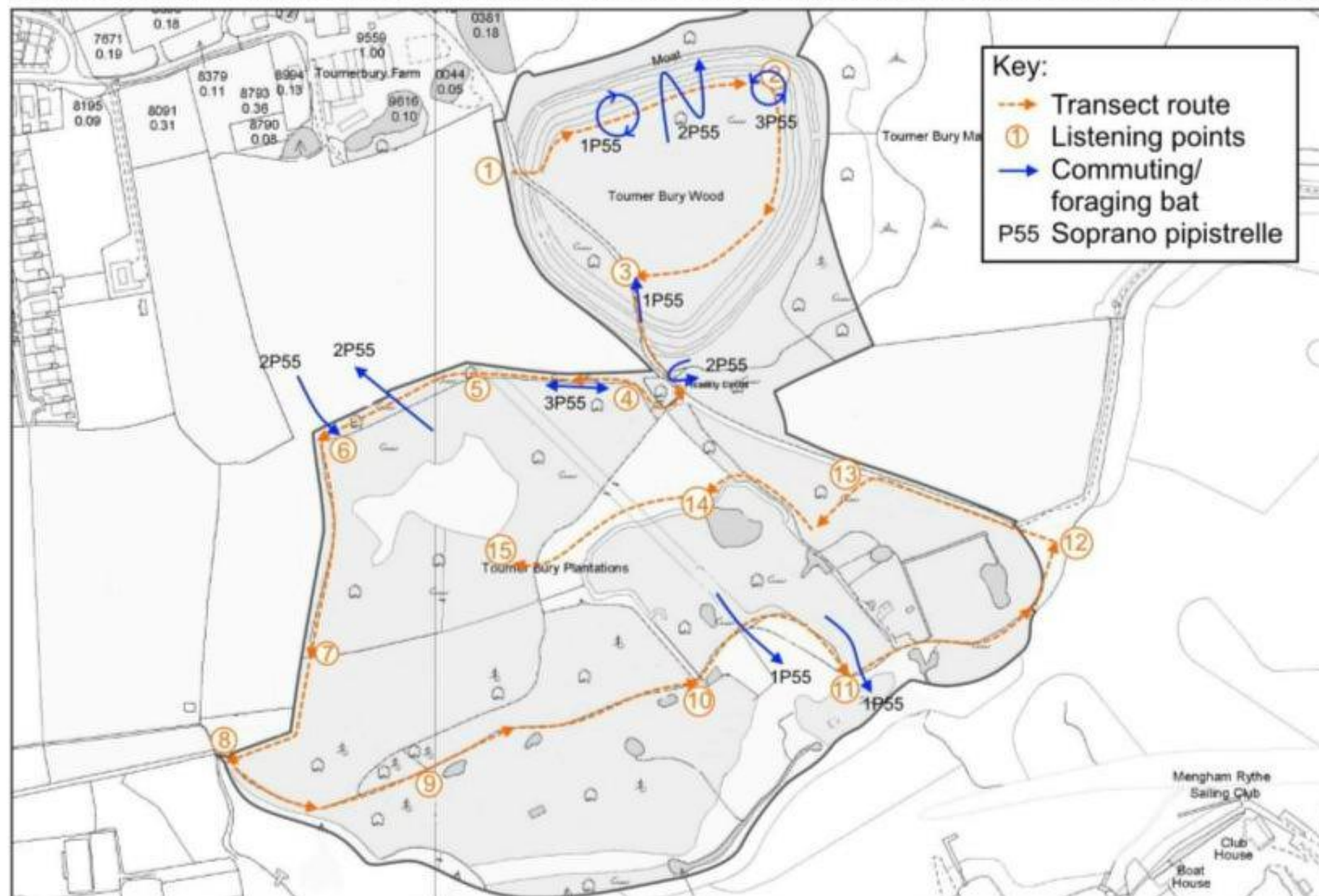


Figure 9. Plan showing bat activity (observations only) for the activity transect survey carried out on the 8th July 2020. Arrows show direction of flight (where known).

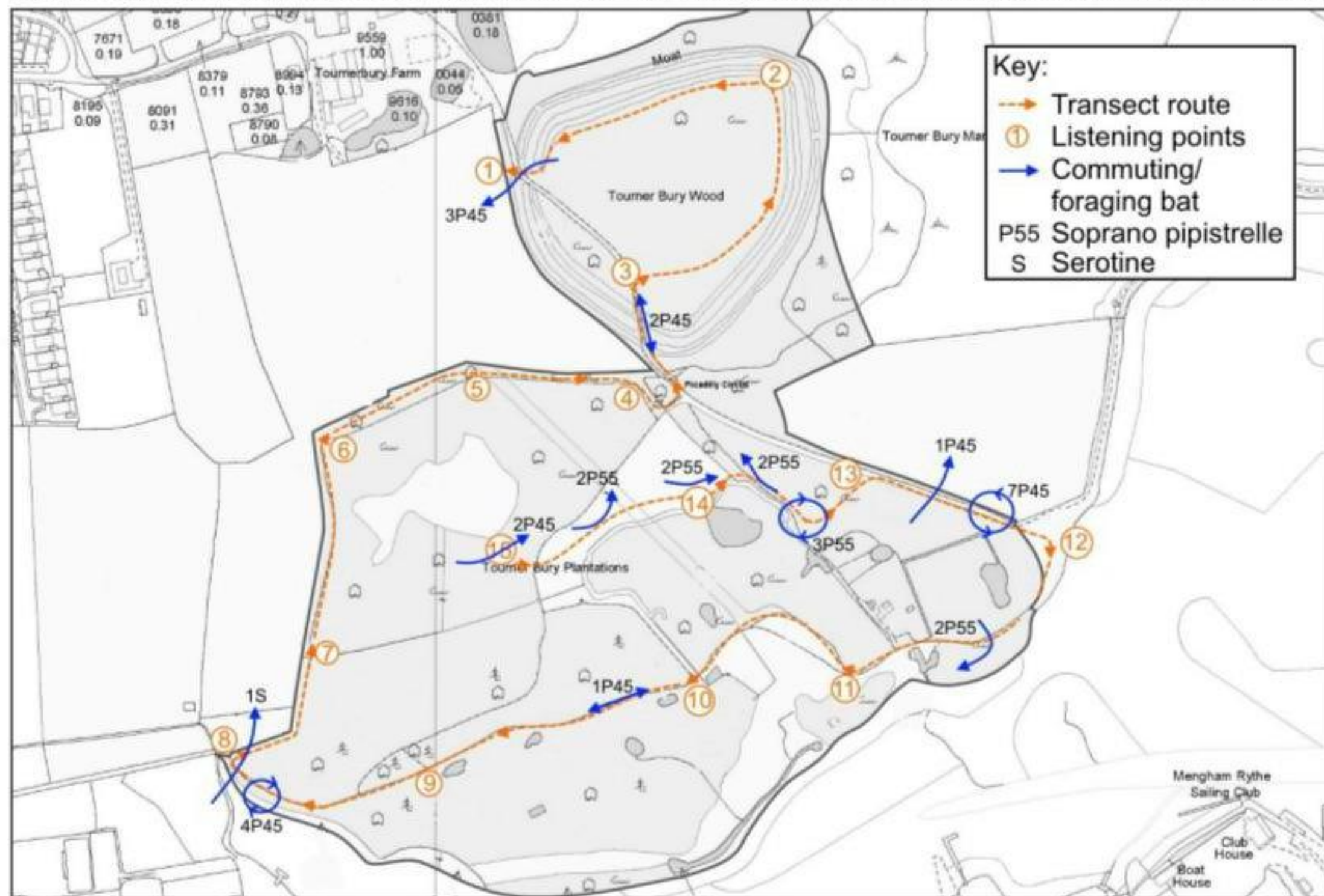


Figure 10. Plan showing bat activity (observations only) for the activity transect survey carried out on the 22nd July 2020. Arrows show direction of flight (where known).

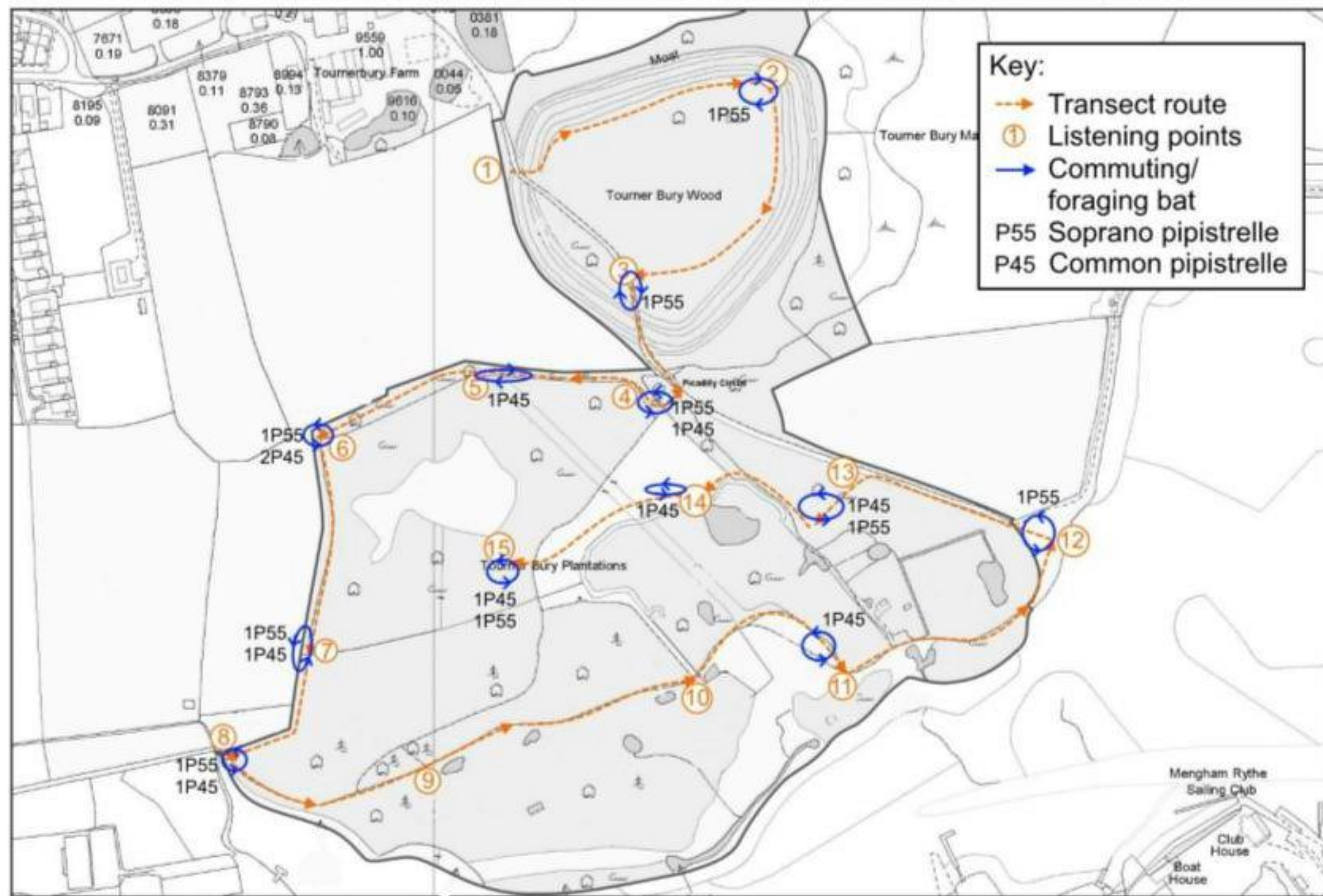


Figure 11. Plan showing bat activity (observations only) for the activity transect survey carried out on the 7th August 2020. Arrows show direction of flight (where known).

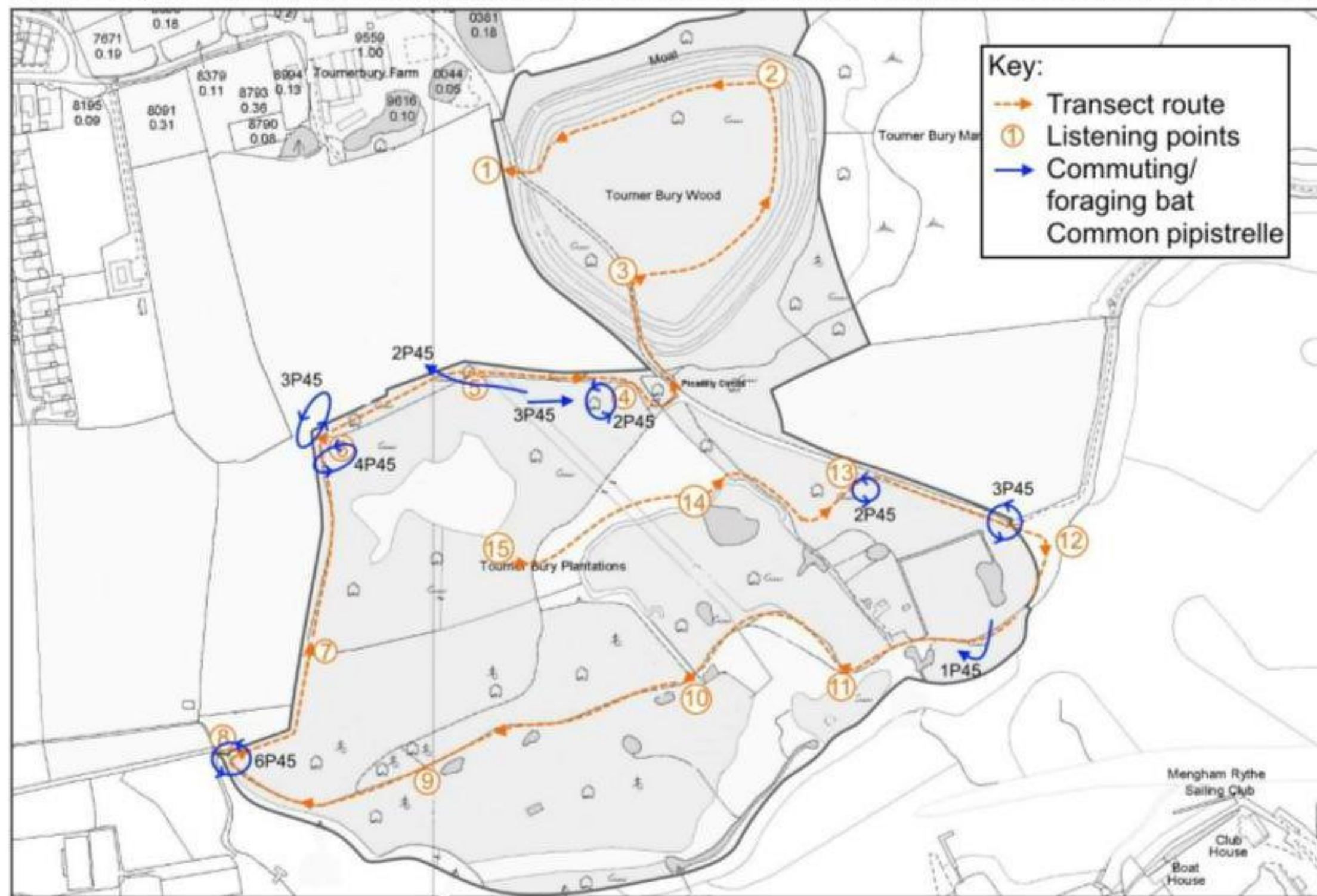


Figure 12. Plan showing bat activity (observations only) for the activity transect survey carried out on the 20th August 2020. Arrows show direction of flight (where known).

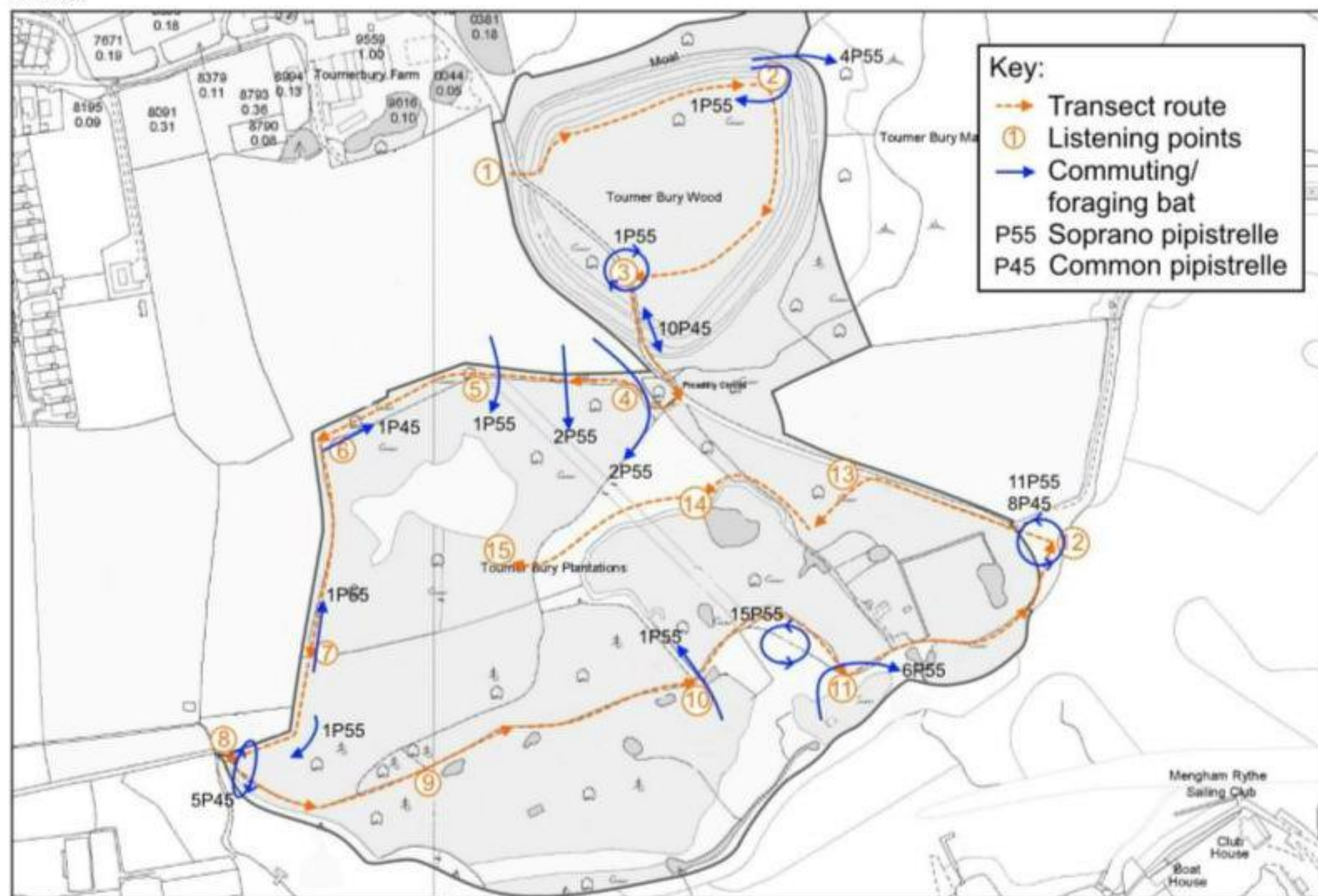


Figure 13. Plan showing bat activity (observations only) for the activity transect survey carried out on the 3rd September 2020. Arrows show direction of flight (where known).

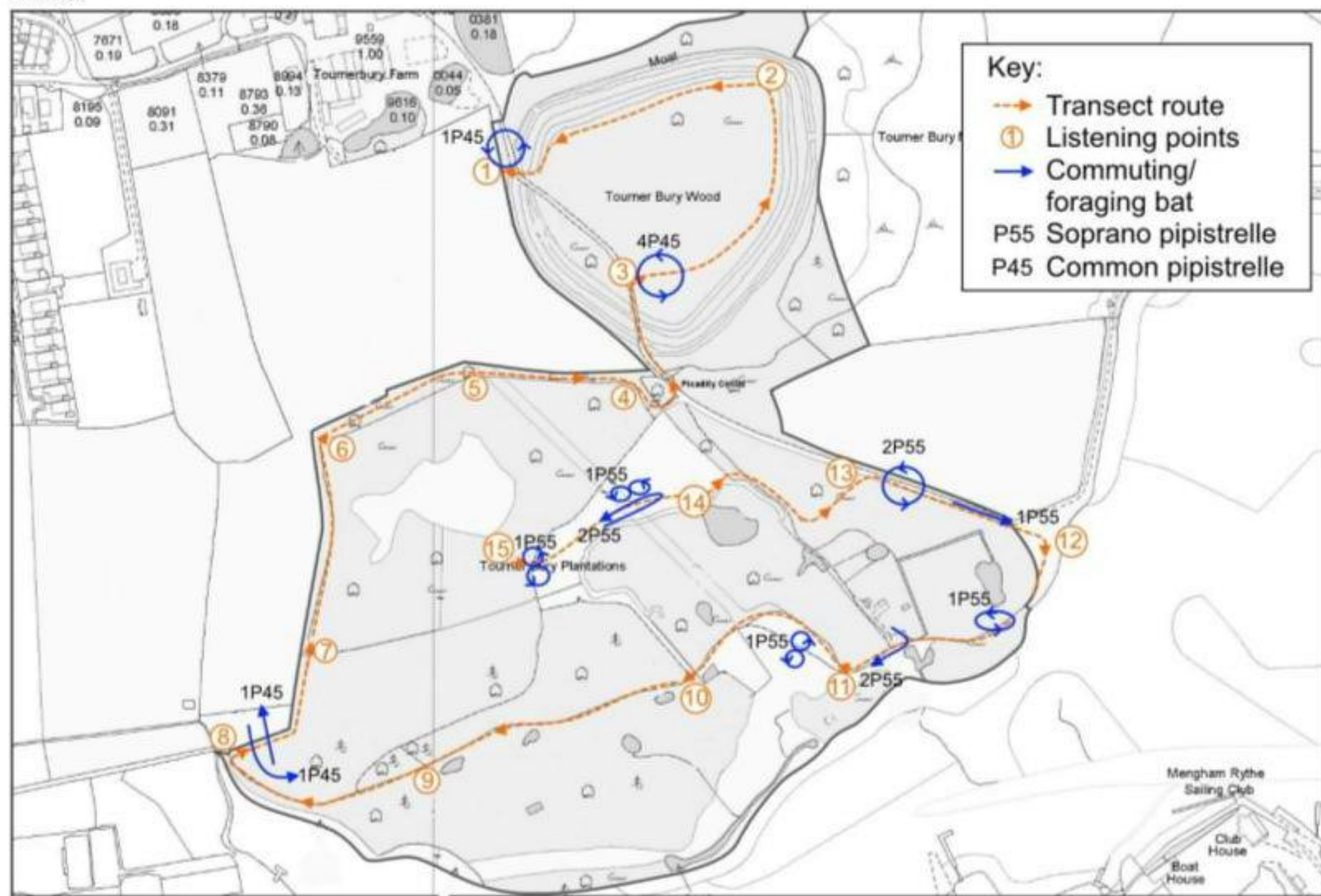
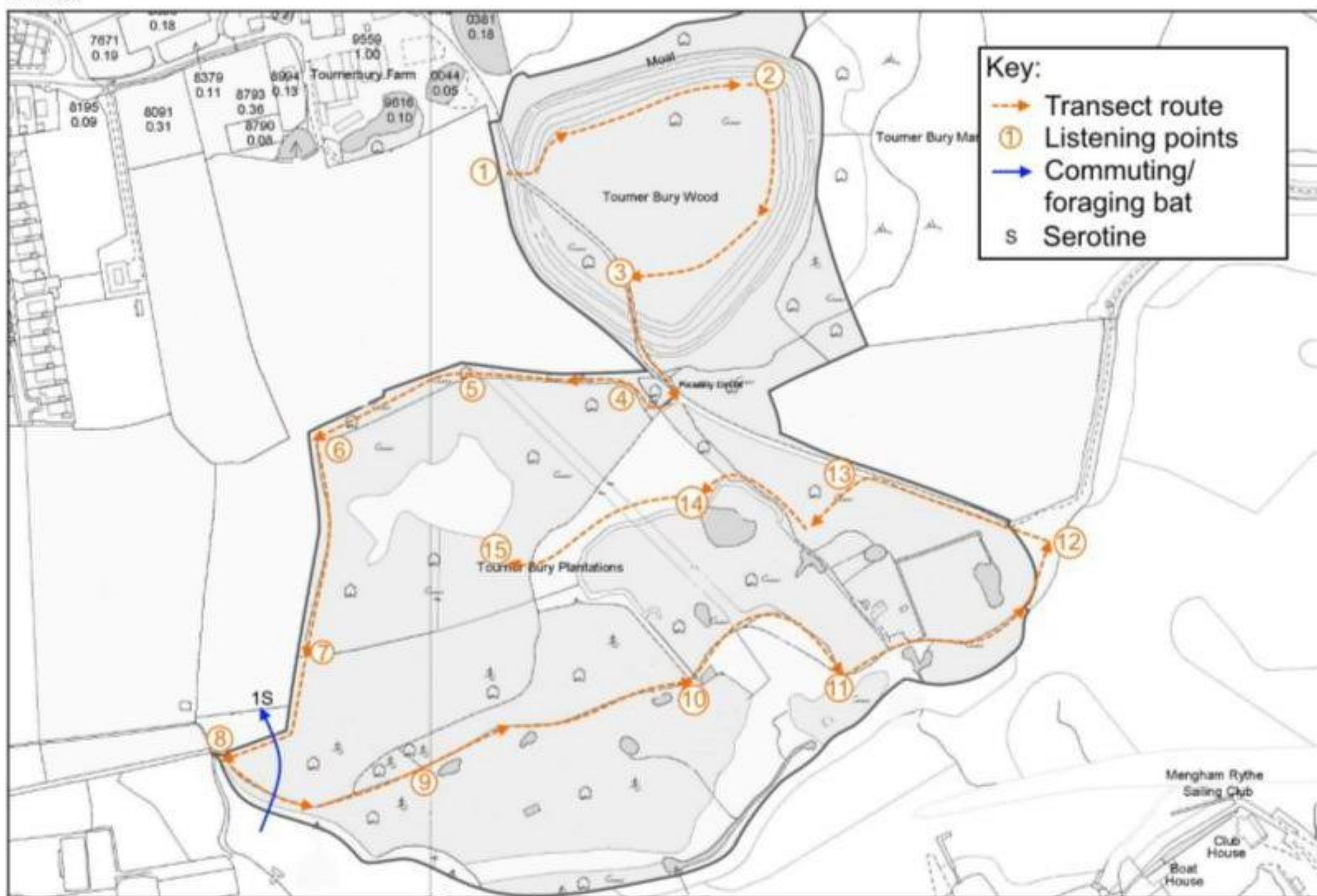


Figure 14. Plan showing bat activity (observations only) for the activity transect survey carried out on the 13th October 2020. Arrows show direction of flight (where known).



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8.1 Legal context

All species of British bat are protected by the *Wildlife and Countryside Act 1981* (as amended) extended by the *Countryside and Rights of Way Act 2000*. This legislation makes it an offence to:

- intentionally kill, injure or take a bat;
- possess or control a bat;
- intentionally or recklessly damage, destroy or obstruct access to a bat roost; and
- intentionally or recklessly disturb a bat whilst it occupies a bat roost.

Bats are also European Protected Species listed on the *Conservation of Habitats & Species Regulations 2017*. This legislation makes it an offence to:

- deliberately capture, injure or kill a bat;
- deliberately disturb a bat (in such a way as to be likely to significantly affect: (i) the ability of a significant group of bats to survive, breed or rear/nurture their young; or (ii) the local distribution or abundance of the species concerned);
- damage or destroy a breeding site or resting place of a bat; and
- possess, control, transport, sell, exchange a bat, or offer a bat for sale or exchange.

All bat roosting sites receive legal protection even when bats are not present (bats tend to reuse the same roost).

Where it is necessary to carry out an action that could result in an offence under the *Conservation of Habitats & Species Regulations 2017* it is possible to apply for a European Protected Species (EPS) licence from Natural England. Licences are only issued where Natural England are satisfied that three derogation tests are met. These are: that the activity is for **imperative reasons of overriding public interest**; that there must be **no satisfactory alternative**; and that **favourable conservation status of the species must be maintained**.

Consideration of these three derogation tests was previously left to Natural England as part of their deliberations on whether to grant a licence for the development activity after a planning consent has been issued. However, the regulations now require that **all** public bodies, i.e. **Local Planning Authorities** (LPAs), have regard to the requirements of the European Habitats Directive when carrying out their functions. As a result, LPAs **must** address the three derogation tests when considering a planning application that could impact upon any European Protected Species (EPS).

8.2 *National planning context*

8.2.1 *General*

Surveys should be completed in line with Natural England's *Standing Advice for Local Authorities* (<http://www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/default.aspx>), which states:

- Natural England will not comment on applications that are submitted without the relevant protected species surveys if there are no other issues (*i.e.* in relation to SSSIs or landscape).
- Natural England will not comment on scoping surveys that recommend further surveys where these have not been undertaken and submitted with the scoping reports.

In addition to the above, *Section 40* of the *Natural Environment and Rural Communities Act* (2006) imposes a new duty on all public authorities to have regard for biodiversity.

8.2.2 *National Planning Policy Framework (NPPF)*

From the 19th February 2019, the Government published the revised National Planning Policy Framework. The document sets out the government's planning policies for England and how these are expected to be applied. This replaces a previous version which was published in March 2012. It states: "*at the heart of the Framework is a presumption in favour of sustainable development (paragraph 11).*"

Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

- an economic objective;
- a social objective; and
- an environmental objective.

The environmental objective is to "*contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy*".

Planning policies and decisions should contribute to and enhance the natural and local environment by "*protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan)*" and "*minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*".

If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.

Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted.

Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.

It states that *"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"*.

It should be noted that the *"presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site"*.

The NPPF also encourages *"minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures"* and aims to *"promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity"*. This applies to non-statutory designated sites including Sites of Importance for Nature Conservation (SINCs) and equivalent county wildlife sites.

Early engagement with all necessary stakeholders, including expert bodies, is encouraged by the NPPF.

Bats use different roosting sites throughout the year according to their life cycle requirements.

Hibernation during the winter months requires roosting sites that are cool and humid. As conditions improve through the spring, bats become increasingly active and tend to use transitional roosting sites. During the summer months, females give birth in maternity roosts. Maternity roosts tend to be warm and temperature-stable, which aids rapid development of the young, which are weaned in late summer. In the autumn, adult bats congregate in mating roosts and also use transitional roosting sites. Autumn is the time when both adults and juveniles have to build up fat reserves in preparation for hibernation through the winter months.

Bats also use roosts during the night as feeding perches. Species that catch large prey items such as moths (*e.g.* brown long-eared bat) often enter buildings to hang up and eat their prey before emerging again to forage. Such feeding perches tend to be obvious from scatterings of bat droppings with moth wings, which the bats discard.

Bats are at their most vulnerable during the summer in their maternity roosts, when disturbance can jeopardise their breeding success. Bats give birth to only one pup per year and young do not breed until the second or third year after birth. This means that if maternity colonies are disturbed there can be serious implications for the conservation status of populations.

Bats are also vulnerable during the winter hibernation period, when disturbance can reduce their chance of survival through the winter at a time when food is in short supply.

This is why there are often only narrow timeframes for bat survey and mitigation work.

APPENDIX C: DUSK EMERGENCE SURVEY DATA

Date	14/07/2020			
Temp	17.0°C at start and 16.4°C at the end			
Weather	Dry, mild and overcast with a light air-light breeze (Beaufort scale 1-2)			
Ecologists	Nicola Pyle, Calum Cooper & Darla Brown			
Observer	Time	No.	Species	Observation
-	20:57		-	Ecologists commenced observations
CC	21:08	1	Soprano pipistrelle	Emerging from the apex of the north-east gable end
CC	21:10	1	Soprano pipistrelle	Emerging from the apex of the north-east gable end
-	21:12		-	Sunset
CC	21:13	1	Soprano pipistrelle	Emerging from the apex of the north-east gable end
CC	21:14	1	Soprano pipistrelle	Emerging from the apex of the north-east gable end
CC	21:15	1	Soprano pipistrelle	Emerging from the apex of the north-east gable end
DB, CC	21:18	1	Soprano pipistrelle	Foraging north-east to the front of the cottage, then to the south-east
CC, NP	21:20	1	Soprano pipistrelle	Commuting north-east over the rear garden
NP	21:21	1	Pipistrelle species	Emerging from under the bargeboard on the south-west elevation
CC	21:21	1	Soprano pipistrelle	Foraging south-west over the rear garden
NP	21:23	1	Common pipistrelle	Heard but not seen
CC	21:24	2	Soprano pipistrelle	Foraging south-west then north-east over the rear garden
CC	21:24	1	Soprano pipistrelle	Foraging south-west over the rear garden
NP	21:26	1	Common pipistrelle	Foraging over the rear garden
CC	21:26	1	Soprano pipistrelle	Heard foraging but not seen
DB	21:29	1	Soprano pipistrelle	Foraging east then north-east over the drive
CC	21:33	1	Soprano pipistrelle	Heard but not seen
CC	21:39	1	Soprano pipistrelle	Foraging south-west then north-east over the rear garden
NP	21:41	1	Soprano pipistrelle	Commuting north-east to the rear of the cottage
CC	21:42	1	Pipistrelle species	Heard but not seen
CC	21:44	2	Soprano pipistrelle	Heard foraging but not seen
DB	21:46	1	Common pipistrelle	Foraging east then north-east over the drive
CC	21:46	1	Soprano pipistrelle	Foraging south-west then north-east over the rear garden

NP, CC	21:48	1	Pipistrelle species	Heard but not seen
DB	21:50	1	Common pipistrelle	Foraging north then east around the cottage
DB	21:50	1	Soprano pipistrelle	Foraging over the driveway, south then returning north
CC	21:50	1	Soprano pipistrelle	Foraging south to the east of the cottage
CC	21:51	1	Soprano pipistrelle	Commuting south-east then north-east, to the east of the cottage
DB	21:52	1	Common pipistrelle	Foraging & feeding east then north-east over the drive
DB, NP	21:52	1	Common pipistrelle	Foraging & feeding east to the north of the cottage
CC	21:52	2	Common pipistrelle	Commuting south-east to the east of the cottage
CC	21:53	1	Common pipistrelle	Commuting south-east to the east of the cottage
NP	21:55	1	Common pipistrelle	Commuting north-east to the front of the cottage
CC	21:56	1	Soprano pipistrelle	Commuting north-east over the rear garden
DB, CC	21:59	1	Common pipistrelle	Foraging east then north-east over the drive
CC, DB	22:01	2	Soprano pipistrelle	Commuting south-east to the east of the cottage
CC, DB	22:01	1	Soprano pipistrelle	Commuting south then east, to the east of the cottage
CC	22:02	1	Soprano pipistrelle	Heard but not seen
DB	22:04	1	Common pipistrelle	Heard but not seen
CC, DB	22:04	1	Soprano pipistrelle	Heard but not seen
CC	22:05	1	Soprano pipistrelle	Commuting west, south of the cottage
NP	22:06	1	Common pipistrelle	Heard but not seen
CC	22:07	1	Soprano pipistrelle	Heard foraging & feeding but not seen
CC	22:07	1	Common pipistrelle	Heard but not seen
DB, NP	22:09	1	Common pipistrelle	Commuting north-west over the cottage
CC	22:10	1	Soprano pipistrelle	Commuting west then north, east of the cottage
DB	22:12	1	Soprano pipistrelle	Heard but not seen
CC	22:12	1	Soprano pipistrelle	Heard foraging & feeding but not seen
NP, DB	22:14	1	Soprano pipistrelle	Commuting south-west over the cottage
CC	22:15	1	Soprano pipistrelle	Heard foraging but not seen until 22:19
CC	22:15	1	Common pipistrelle	Heard but not seen
DB	22:16	1	Common pipistrelle	Heard but not seen
DB	22:18	1	Common pipistrelle	Heard but not seen
CC	22:19	1	Soprano pipistrelle	Commuting north, to the east of the cottage
CC	22:19	1	Common pipistrelle	Heard foraging but not seen
DB, NP	22:21	1	Common pipistrelle	Commuting north over the drive

CC	22:21	1	Soprano pipistrelle	Heard foraging but not seen
CC	22:22	1	Common pipistrelle	Heard but not seen
DB	22:23	1	Common pipistrelle	Heard but not seen
DB	22:23	2	Soprano pipistrelle	Foraging north-east to the front of the cottage
CC	22:23	1	Common pipistrelle	Heard but not seen
NP	22:26	1	Soprano pipistrelle	Commuting south-west over the cottage
CC	22:27	1	Pipistrelle species	Heard but not seen
DB	22:28	1	Pipistrelle species	Commuting north-west over the cottage
CC	22:29	1	Soprano pipistrelle	Heard foraging but not seen
CC	22:29	1	Common pipistrelle	Heard but not seen
DB	22:30	1	Common pipistrelle	Heard but not seen
NP, DB	22:31	1	Common pipistrelle	Commuting west over the balcony
CC	22:31	1	Common pipistrelle	Heard but not seen
NP	22:33	1	Common pipistrelle	Heard but not seen
DB	22:35	1	Common pipistrelle	Heard but not seen
CC	22:35	1	Soprano pipistrelle	Heard but not seen
CC	22:37	1	Soprano pipistrelle	Heard but not seen
NP	22:38	2	Soprano pipistrelle	Heard but not seen
-	22:44	-	-	Ecologists ceased observations
Date	28/07/2020			
Temp	17.2°C at start and 15.7°C at the end			
Weather	Dry, mild and clear with a light breeze-gentle breeze (Beaufort scale 2-3)			
Ecologists	Nicola Pyle, Calum Cooper & Darla Brown			
Observer	Time	No.	Species	Observation
-	20:40		-	Ecologists commenced observations
-	20:55		-	Sunset
NP	20:55	1	Common pipistrelle	Emerging from the south-west gable end on the left side
DB	20:57	1	Soprano pipistrelle	Emerging from the north-east gable end flying north-east
CC	20:58	1	Pipistrelle species	Emerging from the wooden cladding on the west side of the dormer on the north-west elevation
DB	21:00	2	Soprano pipistrelle	Emerging from the north-east gable end flying north-east
DB	21:02	2	Soprano pipistrelle	Emerging from the north-east gable end flying north-east
DB, CC	21:02	1	Soprano pipistrelle	Commuting north-east to the south-east of the cottage
CC	21:07	1	Common pipistrelle	Commuting north-west down the drive from the cottage
DB	21:07	1	Soprano pipistrelle	Emerging from the north-east gable end flying north-east

DB, CC	21:07	1	Soprano pipistrelle	Emerging from the north-east gable end flying north-east
DB, CC	21:08	1	Soprano pipistrelle	Emerging from the north-east gable end flying north-east
NP	21:10	1	Common pipistrelle	Emerging from the south-west gable end on the right side
DB, CC	21:12	1	Soprano pipistrelle	Emerging from the east corner of the cottage flying north-east
CC, DB	21:14	1	Common pipistrelle	Foraging over the driveway from the north-east, feeding then foraging north-west down the driveway
CC, NP	21:15	1	Common pipistrelle	Foraging south-east then north-east over the driveway
DB	21:15	1	Soprano pipistrelle	Foraging and feeding south passed the east corner of the cottage
CC, DB	21:17	1	Common pipistrelle	Heard foraging constantly until 21:28 but not seen
NP, DB	21:18	1	Common pipistrelle	Foraging in garden south-east of the cottage
DB	21:19	1	Soprano pipistrelle	Foraging in garden south-east of the cottage
DB	21:20	1	Common pipistrelle	Commuting north-east to the south-east of the cottage
CC	21:21	1	Soprano pipistrelle	Foraging south-west over the driveway in a zigzag motion
CC	21:21	1	Common pipistrelle	Commuting south-east up driveway towards the cottage
DB	21:21	1	Soprano pipistrelle	Commuting north-east to the south-east of the cottage
NP, DB	21:22	1	Common pipistrelle	Foraging in garden south-east of the cottage
DB	21:23	1	Soprano pipistrelle	Foraging in garden south-east of the cottage
DB	21:24	1	Soprano pipistrelle	Foraging west towards the tree-line
DB	21:24	1	Soprano pipistrelle	Commuting north-east to the south-east of the cottage
DB, CC	21:24	1	Soprano pipistrelle	Foraging in garden south-east of the cottage
CC	21:25	1	Soprano pipistrelle	Commuting from the south, to forage over the driveway then returning south to the garden to forage
DB	21:25	1	Common pipistrelle	Foraging in garden south-east of the cottage
NP	21:26	1	Soprano pipistrelle	Commuting east to the south of the cottage
NP	21:28	1	Soprano pipistrelle	Foraging and feeding up and down the treeline west of the cottage
CC	21:29	1	Soprano pipistrelle	Foraging over the driveway
NP	21:30	1	Common pipistrelle	Commuting south-east up driveway towards the cottage

DB	21:31	1	Soprano pipistrelle	Commuting south-east to the east of the cottage
CC, DB	21:32	1	Soprano pipistrelle	Foraging south-west then north-west over the driveway
DB	21:33	2	Soprano pipistrelle	Heard foraging but not seen
CC, DB	21:34	1	Common pipistrelle	Foraging south-west then north-west over the driveway
CC	21:36	1	Soprano pipistrelle	Foraging south-west then north-west over the driveway
NP	21:36	1	Soprano pipistrelle	Commuting south-east up driveway towards the cottage
CC, DB	21:37	1	Soprano pipistrelle	Heard but not seen
CC, DB	21:40	1	Common pipistrelle	Foraging and feeding unseen, then south-east passed the cottage
DB	21:40	1	Soprano pipistrelle	Foraging and feeding in garden south-east of the cottage
DB	21:43	1	Soprano pipistrelle	Foraging and feeding south-east to the east of the cottage
DB	21:43	1	Common pipistrelle	Heard feeding but not seen
NP, CC	21:44	1	Common pipistrelle	Commuting south through the trees west of the cottage
DB	21:45	1	Common pipistrelle	Foraging and feeding south-east to the east of the cottage
DB	21:45	1	Soprano pipistrelle	Foraging and feeding south-east to the east of the cottage
CC, NP	21:47	1	Soprano pipistrelle	Heard but not seen
CC	21:48	1	Soprano pipistrelle	Heard but not seen
NP	21:49	1	Common pipistrelle	Foraging in garden south-east of the cottage
DB	21:50	1	Common pipistrelle	Foraging west towards the tree-line
CC	21:51	1	Soprano pipistrelle	Heard but not seen
DB	21:52	1	Soprano pipistrelle	Foraging west towards the tree-line
DB, CC	21:52	1	Soprano pipistrelle	Foraging south-east to the east of the cottage
DB	21:53	2	Common pipistrelle	Commuting south-east to the east of the cottage
NP, CC	21:54	1	Soprano pipistrelle	Commuting north through the trees west of the cottage
DB	21:54	1	Soprano pipistrelle	Foraging north-west to the east of the cottage
NP, CC, DB	21:55	1	Soprano pipistrelle	Commuting south through the trees west of the cottage
DB	21:55	1	Soprano pipistrelle	Re-entering the east corner of the cottage, flying from the south-east
CC, NP	21:57	1	Common pipistrelle	Heard foraging and feeding until 22:04 but not seen

DB	21:57	1	Common pipistrelle	Foraging in garden south-east of the cottage
DB	21:58	1	Common pipistrelle	Foraging west towards the tree-line
DB	21:58	1	Soprano pipistrelle	Foraging west towards the tree-line
NP, DB	22:00	1	Common pipistrelle	Foraging up and down the treeline west of the cottage
NP, DB	22:01	1	Common pipistrelle	Commuting north-west towards the cottage
NP	22:06	1	Common pipistrelle	Commuting south-east up driveway towards the cottage
CC	22:10	1	Soprano pipistrelle	Heard but not seen
DB	22:11	1	Soprano pipistrelle	Re-entering the north-east gable end, flying from the south-west
NP, CC, DB	22:13	1	Soprano pipistrelle	Foraging up and down the tree-line west of the cottage
DB	22:13	1	Common pipistrelle	Heard but not seen
NP, DB	22:15	1	Soprano pipistrelle	Commuting east to the south of the cottage
NP, CC	22:16	1	Soprano pipistrelle	Commuting north through the trees west of the cottage
DB	22:16	1	Soprano pipistrelle	Heard but not seen
CC, DB	22:18	1	Common pipistrelle	Heard but not seen
NP, CC	22:18	1	Soprano pipistrelle	Commuting north through the trees west of the cottage
DB	22:18	1	Soprano pipistrelle	Re-entering the north-east gable end, flying from the north
CC	22:19	1	Soprano pipistrelle	Foraging over the driveway
DB	22:19	2	Soprano pipistrelle	Heard but not seen
DB	22:19	1	Soprano pipistrelle	Heard but not seen
CC	22:20	1	Common pipistrelle	Heard but not seen
-	22:25	-	-	Ecologists ceased observations
Date	18.08.20			
Temp	20.0°C at start and 18.7°C at the end			
Weather	Warm, dry and mostly clear with cloud cover varying between 0-5%. Little to light breeze (Beaufort scale 0-1)			
Ecologists	Calum Cooper, Andrew Lomas & Darla Brown			
Observer	Time	No.	Species	Observation
-	20:03	-	-	Ecologists commenced observations
-	20:18	-	-	Sunset
CC	21:26	1	Common pipistrelle	Heard but not seen, 3 passes
CC	21:30	1	Pipistrelle species	Emerging from west gable end then commuting north-west
AL	20:30	1	Soprano pipistrelle	Commuting south to north alongside east side of the cottage
CC	20:31	1	Pipistrelle species	Emerging from west gable end and then commuting south-west

DB	20:31	1	Common pipistrelle	Emerging from apex of the north-east gable end commuting north-east
AL	20:34	1	Soprano pipistrelle	Commuting west to east across the driveway
AL	20:34	1	Soprano pipistrelle	Commuting west to east across the driveway
CC	20:34	1	Pipistrelle species	Emerging from west gable end and then commuting north-west
AL	20:36	1	Pipistrelle species	Seen commuting west to east across the driveway and alongside the north-east side of the cottage
DB	20:37	1	Common pipistrelle	Emerging from apex of the north-east gable end commuting west past the north-east corner of the cottage
DB	20:37	1	Common pipistrelle	Emerging from missing part of eave of the south-east side of the cottage
AL	20:37	1	Soprano pipistrelle	Commuting west to east across the driveway
CC	20:39	1	Soprano pipistrelle	Heard faintly but not seen
AL	20:39	1	Pipistrelle species	Seen commuting west to east across the driveway
DB	20:41	1	Common pipistrelle	Emerging from apex of the north-east gable end commuting north-east
AL	20:44	1	Soprano pipistrelle	Commuting west to east across the driveway
DB	20:44	1	Common pipistrelle	Foraging west to east across the garden south-east side of the cottage
CC	20:45	1	Common pipistrelle	Heard faintly but not seen
DB	20:45	1	Common pipistrelle	Commuting east to west across the garden south-east side of the cottage
DB	20:45	1	Common pipistrelle	Foraging west to east across the garden south-east side of the cottage
DB, AL	20:46	1	Soprano pipistrelle	Foraging east to west across the garden south-east side of the cottage
DB, CC	20:46	1	Common pipistrelle	Foraging and feeding amongst the treeline south-west side of the cottage until 21:05
AL	20:50	1	Soprano pipistrelle	Heard social calls but not seen
AL	20:52	1	Soprano pipistrelle	Heard but not seen
AL	20:53	1	Soprano pipistrelle	Foraging west to east across the driveway
DB, CC	20:53	1	Soprano pipistrelle	Heard but not seen
AL	20:54	1	Soprano pipistrelle	Foraging west to east across the driveway
DB	20:54	1	Common pipistrelle	Foraging south-east from the driveway
CC	20:55	1	Common pipistrelle	Foraging and feeding amongst the treeline south-west side of the cottage until 21:05
DB, AL	20:55	1	Common pipistrelle	Foraging south-east from the driveway
AL, CC	20:59	1	Soprano pipistrelle	Commuting south to north alongside east side of the cottage

AL	21:00	1	Soprano pipistrelle	Heard but not seen
AL	21:03	1	Soprano pipistrelle	Commuting east to west over the cottage
DB	21:04	1	Soprano pipistrelle	Heard but not seen
DB	21:05	1	Common pipistrelle	Foraging east to west across the garden south-east side of the cottage
DB	21:05	1	Common pipistrelle	Foraging west to east across the garden south-east side of the cottage
AL	21:05	1	Soprano pipistrelle	Heard but not seen
AL	21:05	1	Common pipistrelle	Heard but not seen
AL	21:06	1	Common pipistrelle	Heard but not seen
CC	21:07	1	Common pipistrelle	Heard foraging but not seen
CC	21:07	1	Common pipistrelle	Heard foraging but not seen, 3 passes
CC	21:08	2	Common pipistrelle	Heard foraging, feeding and social calls but not seen
DB	21:08	1	Common pipistrelle	Foraging east to west across the garden south-east side of the cottage
DB	21:08	1	Soprano pipistrelle	Heard but not seen
DB, AL	21:09	1	Common pipistrelle	Commuting north towards the driveway from the south-east side of the cottage
AL	21:10	1	Soprano pipistrelle	Heard but not seen
CC	21:11	2	Common pipistrelle	Heard foraging and feeding but not seen
DB	21:11	1	Common pipistrelle	Foraging west to east across the garden south-east side of the cottage
AL	21:12	1	Common pipistrelle	Foraging west to east across the driveway
DB	21:12	1	Common pipistrelle	Heard foraging and feeding but not seen
CC	21:13	1	Soprano pipistrelle	Heard foraging and feeding but not seen
DB	21:13	1	Common pipistrelle	Foraging west to east across the garden south-east side of the cottage
AL	21:13	1	Common pipistrelle	Heard but not seen
AL, CC	21:14	2	Soprano pipistrelle	Heard foraging and feeding but not seen
DB	21:14	1	Common pipistrelle	Heard foraging and feeding but not seen
DB	21:15	1	Common pipistrelle	Foraging east to west across the garden south-east side of the cottage
DB	21:15	1	Common pipistrelle	Foraging west to east across the garden south-east side of the cottage
AL	21:15	1	Soprano pipistrelle	Heard social calls but not seen
CC	21:15	###	Soprano pipistrelle	Heard foraging and feeding but not seen until 21:19
AL	21:16	1	Soprano pipistrelle	Commuting south to west across the driveway
AL	21:17	1	Common pipistrelle	Heard but not seen
AL	21:17	1	Common pipistrelle	Commuting south-east to west amongst treeline at the south-west side of the cottage
AL	21:17	1	Noctule	Heard but not seen

AL	21:18	1	Common pipistrelle	Heard but not seen
DB	21:18	1	Common pipistrelle	Heard but not seen
DB	21:18	1	Soprano pipistrelle	Heard but not seen
DB	21:18	1	Common pipistrelle	Heard foraging and feeding but not seen
CC	21:19	2	Soprano pipistrelle	Circling over the driveway
CC	21:19	1	Common pipistrelle	Heard foraging and feeding but not seen until 21:24
AL	21:20	1	Common pipistrelle	Heard but not seen
AL	21:21	1	Common pipistrelle	Heard but not seen
AL	21:22	1	Common pipistrelle	Heard but not seen
AL	21:23	1	Common pipistrelle	Heard but not seen
AL	21:24	1	Common pipistrelle	Commuting south-east to west amongst treeline at the south-west side of the cottage
AL	21:25	1	Common pipistrelle	Heard but not seen
CC	21:25	3	Common pipistrelle	Heard foraging but not seen
AL, CC	21:29	1	Common pipistrelle	Heard but not seen
AL	21:30	1	Noctule	Heard but not seen
AL, CC	21:30	1	Soprano pipistrelle	Heard foraging and feeding but not seen
AL, CC	21:34	1	Common pipistrelle	Heard but not seen
AL	21:36	1	Common pipistrelle	Heard but not seen
DB, CC	21:36	1	Common pipistrelle	Heard foraging, feeding and social calls but not seen
AL	21:37	1	Soprano pipistrelle	Heard social calls but not seen
AL	21:38	1	Soprano pipistrelle	Heard social calls but not seen
CC	21:38	1	Common pipistrelle	Heard foraging, feeding and social calls but not seen, 3 passes
DB	21:39	1	Common pipistrelle	Heard but not seen
CC	21:40	2	Soprano pipistrelle	Heard foraging but not seen
AL	21:40	1	Soprano pipistrelle	Heard social calls but not seen
AL	21:45	1	Soprano pipistrelle	Heard social calls but not seen
DB	21:46	1	Common pipistrelle	Heard but not seen
AL	21:46	1	Noctule	Heard but not seen
AL	21:48	1	Noctule	Heard but not seen
AL	21:48	1	Soprano pipistrelle	Heard but not seen
-	21:48	-	-	Ecologists ceased observations

APPENDIX D: ACTIVITY TRANSECT DATA

Date	24/06/2020		
Temp	21.5°C at start and 20.0°C at the end		
Weather	Dry, clear and calm (Beaufort scale 0)		
Ecologists	Nicola Pyle & Calum Cooper		
Listening point	Time	Species	Observation
-	21:23	-	Sunset
-	21:27	-	Ecologists commenced observations
1 start	21:28	-	-
1 end	21:31	-	-
-	-	Soprano pipistrelle	Foraging in the woodland
-	-	Soprano pipistrelle	Foraging and chasing one another in the woodland, 6 passes
2 start	21:38	-	-
-	-	Soprano pipistrelle	Foraging and feeding in the woodland, 30 passes
2 end	21:41	-	-
-	-	Soprano pipistrelle	Heard foraging but not seen
-	-	Soprano pipistrelle	Heard foraging but not seen
3 start	21:45	-	-
-	-	Soprano pipistrelle	Heard but not seen
3 end	21:48	-	-
-	-	Soprano pipistrelle	Heard but not seen
-	-	Soprano pipistrelle	Foraging up and down the track
4 start	21:50	-	-
-	-	Soprano pipistrelle	Heard but not seen, 3 passes
-	-	Soprano pipistrelle	Foraging over the track, 2 passes
4 end	21:53	-	-
-	-	Common pipistrelle	Heard but not seen, 3 passes
-	-	Soprano pipistrelle	Foraging up and down the track
5 start	21:56	-	-
-	-	Soprano pipistrelle	Heard but not seen, 2 passes
5 end	21:59	-	-
-	-	Soprano pipistrelle	Foraging north-west from woodland to fields
6 start	22:02	-	-
-	-	Soprano pipistrelle	Heard foraging and feeding but not seen, 8 passes
-	-	Soprano pipistrelle	Foraging south into the woodland from the fields
6 end	22:05	-	-
-	-	Soprano pipistrelle	Heard foraging but not seen, 4 passes
7 start	22:08	-	-

-	-	Soprano pipistrelle	Heard but not seen
7 end	22:11	-	-
		Soprano pipistrelle	Heard foraging and feeding but not seen, 5 passes
8 start	22:14	-	-
-	-	Soprano pipistrelle	Heard constantly foraging and feeding but not seen
8 end	22:17	-	-
-	-	Soprano pipistrelle	Heard but not seen, 3 passes
9 start	22:20	-	-
-	-	Soprano pipistrelle	Heard foraging but not seen, 2 passes
9 end	22:23	-	-
-	-	Soprano pipistrelle	Heard but not seen, 5 passes
10 start	22:26	-	-
-	-	Soprano pipistrelle	Heard foraging and feeding but not seen, 5 passes
10 end	22:29	-	-
-	-	Soprano pipistrelle	Commuting south-east over the open gravel area
11 start	22:32	-	-
-	-	Soprano pipistrelle	Foraging south-east towards the shore
-	-	Serotine	Heard but not seen
-	-	Soprano pipistrelle	Heard but not seen
11 end	22:35	-	-
12 start	22:37	-	-
12 end	22:40	-	-
13 start	22:43	-	-
13 end	22:46	-	-
-	-	Soprano pipistrelle	Heard but not seen
14 start	22:48	-	-
14 end	22:51	-	-
15 start	22:54	-	-
-	-	Pipistrelle species	Heard but not seen, 2 passes
-	-	Common pipistrelle	Heard but not seen, 3 passes
15 end	22:57	-	-
-	22:57	-	Ecologists ceased observations
Date	08/07/2020		
Temp	17.7°C at start and 16.9°C at the end		
Weather	Dry, overcast and calm (Beaufort scale 0)		
Ecologists	Calum Cooper & Darla Brown		
Listening point	Time	Species	Observation
-	21:17	-	Sunset
-	21:19	-	Ecologists commenced observations
15 start	21:19	-	-
-	-	Common pipistrelle	Foraging east through woodland
15 end	21:22	-	-

-	-	Soprano pipistrelle	Foraging north-east through woodland, 5 passes
14 start	21:25	-	
-	-	Soprano pipistrelle	Foraging and feeding east through the woodland, 6 passes
-	-	Common pipistrelle	Heard foraging but not seen
14 end	21:28	-	-
-	-	Soprano pipistrelle	Foraging north-west over the car park
-	-	Soprano pipistrelle	Foraging in circles over the car park, 7 passes
13 start	21:33	-	-
-	-	Common pipistrelle	Foraging in circles over the car park, 5 passes. Heard but not seen, 15 passes
-	-	Soprano pipistrelle	Heard but not seen, 4 passes
13 end	21:36	-	-
-	-	Common pipistrelle	Heard but not seen, 11 passes. Foraging over the track, 7 passes
-	-	Soprano pipistrelle	Heard but not seen, 6 passes. Commuting north-east across the track, 1 pass.
12 start	21:39	-	-
12 end	21:42	-	-
-	-	Soprano pipistrelle	Foraging near the shore, 2 passes. Heard but not seen 3 passes
11 start	21:44	-	-
-	-	Soprano pipistrelle	Heard but not seen, 1 pass
11 end	21:47	-	-
-	-	Soprano pipistrelle	Heard but not seen , 4 passes
10 start	21:48	-	-
-	-	Soprano pipistrelle	Heard but not seen , 2 passes
-	-	Common pipistrelle	Heard but not seen , 1 pass
10 end	21:51		
-	-	Common pipistrelle	Foraging along the track, 1 pass. Heard but not seen, 3 passes
9 start	21:55	-	-
9 end	21:58	-	-
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 8 passes
-	-	Serotine	Heard but not seen, 1 pass
8 start	22:01	-	-
-	-	Common pipistrelle	Foraging over the track, 4 passes. Heard but not seen, 12 passes
-	-	Serotine	Foraging over (disused) entrance track, 1 pass
8 end	22:04	-	-
-	-	Common pipistrelle	Heard but not seen, 3 passes
7 start	22:08	-	-
7 end	22:11	-	-

		Common pipistrelle	Heard but not seen, 5 passes
6 start	22:13	-	-
-	-	Common pipistrelle	Hard but not seen, 4 passes
6 end	22:16		
-	-	Common pipistrelle	Hard but not seen, 4 passes
5 start	22:18	-	-
5 end	22:21	-	-
4 start	22:22	-	-
-	-	Common pipistrelle	Heard but not seen, 3 passes
4 end	22:25	-	-
-	-	Common pipistrelle	Foraging and feeding up and down the access track, 2 passes. Heard but not seen, 2 passes
-	-	Soprano pipistrelle	Heard but not seen, 2 passes
3 start	22:28	-	-
-	-	Common pipistrelle	Heard foraging but not seen, 11 passes
3 end	22:31	-	-
-	-	Common pipistrelle	Heard but not seen, 1 pass
2 start	22:34	-	-
2 end	22:37	-	-
-	-	Soprano pipistrelle	Heard but not seen, 1 pass
-	-	Common pipistrelle	Heard but not seen, 2 passes
1 start	22:39	-	-
-	-	Soprano pipistrelle	Heard but not seen 2 passes
-	-	Common pipistrelle	Foraging and feeding, 3 passes
1 end	22:42	-	
-	22:57	-	Ecologists ceased observations
Date	22/07/2020		
Temp	19.0°C at start and 17.0°C at the end		
Weather	Dry with 20% cloud cover and calm (Beaufort scale 0)		
Ecologists	Nicola Pyle & Darla Brown		
Listening point	Time	Species	Observation
-	21:03	-	Sunset
-	21:03	-	Ecologists commenced observations
1 start	21:09	-	-
1 end	21:13	-	-
-	-	Soprano pipistrelle	4 passes
2 start	21:17	-	-
-	-	Soprano pipistrelle	Constant foraging, 2 passes
2 end	21:21	-	-
-	-	Soprano pipistrelle	1 pass
-	-	Common pipistrelle	1 pass
3 start	21:26	-	-

-	-	Soprano pipistrelle	4 Passes
3 end	21:30	-	-
-	-	Soprano pipistrelle	2 passes
4 start	21:32	-	-
-	-	Common pipistrelle	2 passes
-	-	Soprano pipistrelle	2 passes
4 end	21:36	-	-
5 start	21:39	-	-
-	-	Common pipistrelle	4 passes
5 end	21:43	-	-
-	-	Common pipistrelle	2 passes
-	-	Soprano pipistrelle	2 passes
6 start	21:47	-	-
-	-	Common pipistrelle	6 passes
-	-	Soprano pipistrelle	1 pass
6 end	21:51	-	-
-	-	Common pipistrelle	3 passes
7 start	21:55	-	-
-	-	Common pipistrelle	2 passes
-	-	Soprano pipistrelle	3 passes
7 end	21:59	-	-
		Soprano pipistrelle	2 passes
		Common pipistrelle	3 passes
8 start	22:03	-	-
-	-	Common pipistrelle	6 passes
-	-	Soprano pipistrelle	1 pass
8 end	22:07		-
-	-	Common pipistrelle	2 passes
9 start	22:13	-	-
9 end	22:17	-	-
10 start	22:22	-	-
-	-	Common pipistrelle	1 pass
10 end	22:26	-	-
11 start	22:31	-	-
-	-	Common pipistrelle	2 passes
11 end	22:35	-	-
12 start	22:39	-	-
		Soprano pipistrelle	2 passes
12 end	22:43	-	-
13 start	22:48	-	-
-	-	Common pipistrelle	1 pass
-	-	Soprano pipistrelle	2 passes
13 end	22:52	-	-

14 start	22:55	-	-
-	-	Common pipistrelle	1 pass
14 end	22:59	-	-
-	-	Common pipistrelle	2 passes
15 start	23:03	-	-
-	-	Common pipistrelle	3 passes
-	-	Soprano pipistrelle	1 pass
15 end	23:07	-	-
-	23:07	-	Ecologists ceased observations
Date	07/08/2020		
Temp	17.4°C at start and 16.0°C at the end		
Weather	Dry with clear skies and calm (Beaufort scale 0)		
Ecologists	Calum Cooper & Darla Brown		
Listening point	Time	Species	Observation
-	04:11	-	Ecologists commenced observations
15 start	04:11	-	-
-	-	Common pipistrelle	Heard but not seen
15 end	04:14	-	-
-	-	Common pipistrelle	Heard but not seen
14 start	04:17	-	-
-	-	Common pipistrelle	Heard but not seen, 2 passes
14 end	04:20	-	-
-	-	Common pipistrelle	Heard but not seen, 2 passes
-	-	Soprano pipistrelle	Heard but not seen
13 start	04:22	-	-
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 8 passes. Foraging and feeding over the carpark/ track, 2 passes
13 end	04:25	-	-
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 10 passes.
12 start	04:27	-	-
		Common pipistrelle	Heard foraging and feeding but not seen, 15 passes. Foraging and feeding in the canopy at the grassy south-east edge of the site, 3 passes
12 end	04:30	-	-
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 3 passes. Foraging and feeding south-east of the Cottage
11 start	04:33	-	-
11 end	04:36	-	-
10 start	04:38	-	-
-	-	Common pipistrelle	Heard but not seen, 2 passes
10 end	04:41	-	-

-	-	Common pipistrelle	Heard but not seen
9 start	04:44	-	-
	-	Common pipistrelle	Heard but not seen
9 end	04:47	-	-
-	-	Common pipistrelle	Heard but not seen
8 start	04:49	-	
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 10 passes. Foraging and feeding over the south-west access track to the site, 6 passes
8 end	04:52	-	-
7 start	04:53	-	-
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 13 passes
7 end	04:56	-	-
		Common pipistrelle	Heard but not seen, 5 passes
6 start	04:58	-	-
-		Common pipistrelle	Heard foraging and feeding but not seen, 13 passes. Foraging and feeding within the plantation woodland, 3 passes. Foraging and feeding in the fields beyond the north-west corner of the site, 4 passes.
6 end	05:01	-	-
-	-	Common pipistrelle	Heard but not seen, 4 passes.
5 start	05:03	-	-
-	-	Common pipistrelle	Heard foraging but not seen, 10 passes. Foraging west along the track north of the plantation woodland, 2 passes.
-	-	Soprano pipistrelle	Heard but not seen
5 end	05:06	-	-
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 10 passes. Foraging east along the track north of the plantation woodland, 3 passes. Foraging and feeding within the canopy of the plantation woodland, 2 passes.
4 start	05:08	-	-
-	-	Common pipistrelle	Heard but not seen, 2 passes
4 end	05:11	-	-
3 start	05:12	-	-
3 end	05:15	-	-
-	-	-	Heard but not seen, 4 passes.
2 start	05:19	Common pipistrelle	-
-	-	-	Heard but not seen, 3 passes.
2 end	05:22	-	-
-	-	Common pipistrelle	Heard but not seen, 3 passes.
-	-	Soprano pipistrelle	Heard but not seen

1 start	05:25	-	-
-	-	Common pipistrelle	Heard but not seen, 2 passes
1 end	05:28	-	-
-	05:28	-	Ecologists ceased observations
-	05:40	-	Sunrise
Date	20/08/2020		
Temp	19.0°C at start and 19.0°C at the end		
Weather	Dry with 75% cloud cover and calm (Beaufort scale 0)		
Ecologists	Calum Cooper & Darla Brown		
Listening point	Time	Species	Observation
-	20:00	-	Ecologists commenced observations
1 start	20:00	-	-
1 end	20:03	-	-
-	-	Soprano pipistrelle	Heard but not seen, 3 passes.
2 start	20:06	-	-
-	-	Soprano pipistrelle	Foraging in a circle, 4 passes. Commuting east, 1 pass. Heard foraging and feeding but not seen, 2 passes.
2 end	20:09	-	-
-	-	Soprano pipistrelle	Heard but not seen, 4 passes.
3 start	20:12	-	-
-	-	Soprano pipistrelle	Foraging and circling, 3 passes. Heard foraging and feeding but not seen, 6 passes.
-	-	Common pipistrelle	Foraging up and down the access track, 5 passes. Heard but not seen, 6 passes.
-	-	Serotine	Heard but not seen, 1 pass
-	20:14	-	Sunset
3 end	20:15	-	-
-	-	Common pipistrelle	Foraging up and down the access track, 5 passes.
4 start	20:16	-	-
-	-	Soprano pipistrelle	Commuting south-east then south-west into the plantation woodland.
4 end	20:19	-	-
-	-	Soprano pipistrelle	Commuting south into the plantation woodland, 2 passes. Commuting south into the plantation woodland, 1 pass. Heard but not seen, 2 passes.
5 start	20:21	-	-
-	-	Soprano pipistrelle	Heard but not seen, 1 pass.
5 end	20:24	-	-
-	-	Common pipistrelle	Commuting north-east along the boundary track, 1 pass
6 start	20:25	-	-

-	-	Soprano pipistrelle	Heard foraging and feeding, but not seen, 2 passes.
6 end	20:28	-	-
7 start	20:29	-	-
-	-	Soprano pipistrelle	Commuting north along the boundary track, 1 pass. Heard but not seen, 2 passes.
-	-	Common pipistrelle	Heard but not seen, 1 pass.
7 end	20:32	-	-
-	-	Soprano pipistrelle	Commuting south along the boundary track, 1 pass. Heard foraging and feeding but not seen, 7 passes.
8 start	20:33	-	-
-	-	Soprano pipistrelle	Heard foraging but not seen, 6 passes.
-	-	Common pipistrelle	Foraging and circling, 5 passes. Heard foraging and feeding but not seen, 10 passes.
-	-	Serotine	Heard but not seen, 1 pass.
8 end	20:40	-	-
-	-	Common pipistrelle	Heard but not seen, 2 passes.
9 start	20:42	-	-
9 end	20:45	-	-
-	-	Common pipistrelle	Heard but not seen 3 passes.
10 start	20:47	-	-
-	-	Soprano pipistrelle	Commuting north through the woodland, 1 pass.
10 end	20:50	-	-
-	-	Soprano pipistrelle	Foraging and circling the grassland, 5 passes. Heard foraging but not seen, 5 passes.
11 start	20:52	-	-
-	-	Soprano pipistrelle	Foraging and circling the grassland, 10 passes. Foraging east along the boundary track, 4 passes. Heard foraging but not seen, 13 passes.
11 end	20:55	-	-
-	-	Soprano pipistrelle	Foraging east along the boundary track, 2 passes. Heard but not seen, 3 passes.
12 start	20:58	-	-
-	-	Soprano pipistrelle	Foraging and circling over the grassland at the south-east corner of the site, 10 passes. Heard foraging but not seen, 3 passes.
-	-	Common pipistrelle	Foraging and circling over the grassland at the south-east corner of the site, 8 passes. Heard foraging but not seen, 3 passes.
12 end	21:01	-	-
-	-	Soprano pipistrelle	Foraging and circling over the grassland at the south-east corner of the site, 1 pass.
13 start	21:04	-	-
-	-	Common pipistrelle	Heard foraging and feeding, but not seen, 13 passes.

13 end	21:07	-	-
-	-	Common pipistrelle	Heard but not seen, 3 passes.
14 start	21:09	-	-
14 end	21:12	-	-
15 start	21:14	-	-
-	-	Soprano pipistrelle	Heard but not seen, 2 passes.
-	-	Common pipistrelle	Heard but not seen, 1 pass.
15 end	21:17	-	-
-	21:17	-	Ecologists ceased observations
Date	03/09/2020		
Temp	17.4°C at start and 16.0°C at the end		
Weather	Dry with clear skies and calm (Beaufort scale 0)		
Ecologists	Calum Cooper & Darla Brown		
Listening point	Time	Species	Observation
-	19:44	-	Ecologists commenced observations
-	19:44	-	Sunset
15 start	19:44	-	-
-	-	Soprano pipistrelle	Heard but not seen, 5 passes. Foraging and feeding circling overhead amongst trees, 1 pass.
15 end	19:47	-	-
-	-	Pipistrelle species	Heard but not seen, 1 pass
-	-	Soprano pipistrelle	Foraging and circling along path, 2 passes.
14 start	19:50	-	-
-	-	Soprano pipistrelle	Foraging and feeding, circling amongst trees, 1 pass
14 end	19:53	-	-
-	-	Soprano pipistrelle	Heard but not seen, 1 pass
13 start	19:55	-	-
-	-	Common pipistrelle	Heard but not seen, 1 pass
-	-	Soprano pipistrelle	Heard but not seen, 5 passes
13 end	19:58	-	-
-	-	Soprano pipistrelle	Heard but not seen, 2 passes. Foraging and feeding near listening point 13, 2 passes. Foraging along path towards listening point 12, 1 pass.
12 start	20:01	-	-
-	-	Soprano pipistrelle	Heard foraging and feeding but not seen, 4 passes
12 end	20:04	-	-
-	-	Soprano pipistrelle	Heard foraging and feeding but not seen, 3 passes. Foraging and circling amongst trees by pond, 1 pass. Foraging and feeding along path from Tournurbury Woods Cottage, 2 passes
11 start	20:07	-	-

-	-	Soprano pipistrelle	Heard but not seen, 3 passes. Foraging and feeding on open land for 1 minutes, 1 pass.
11 end	20:10	-	-
10 start	20:12	-	-
-	-	Common pipistrelle	Heard but not seen, 1 pass
10 end	20:15	-	-
9 start	20:17	-	-
-	-	Common pipistrelle	Heard but not seen, 1 pass
9 end	20:20	-	-
-	-	Common pipistrelle	Heard but not seen, 1 pass
8 start	20:22	-	-
-	-	Common pipistrelle	Heard foraging but not seen, 1 pass. Foraging from adjacent field, 2 passes. Foraging and feeding overhead heading towards the field, 1 pass.
8 end	20:25	-	-
-	-	Common pipistrelle	Heard but not seen, 1 pass
7 start	20:26	-	-
-	-	Common pipistrelle	Heard foraging but not seen, 4 passes
7 end	20:29	-	-
-	-	Common pipistrelle	Heard but not seen, 5 passes.
6 start	20:30	-	-
-	-	Common pipistrelle	Heard foraging and social calls but not seen, 5 passes
6 end	20:33	-	-
-	-	Common pipistrelle	Heard foraging but not seen, 1 pass.
5 start	20:34	-	-
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 6 passes.
5 end	20:37	-	-
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 5 passes
4 start	20:39	-	-
-	-	Pipistrelle species	Heard but not seen, 1 pass
-	-	Common pipistrelle	Heard but not seen, 3 passes.
4 end	20:42	-	-
-	-	Common pipistrelle	Heard but not seen, 3 passes.
3 start	20:43	-	-
-	-	Common pipistrelle	Heard foraging and feeding but not seen, 5 passes
-	-	Soprano pipistrelle	Heard foraging and feeding but not seen, 1 pass
3 end	20:46	-	-
-	-	Common pipistrelle	Heard constant foraging and feeding but not seen, 2 passes.
-	-	Soprano pipistrelle	Heard constant foraging and feeding but not seen, 7 passes.
2 start	20:49	-	-

-	-	Common pipistrelle	Heard constantly but not seen, 5 passes. Foraging and feeding above, 4 passes.
2 end	20:52	-	-
-	-	Common pipistrelle	Heard constantly foraging and feeding but not seen, 6 passes.
1 start	20:55	-	-
-	-	Common pipistrelle	Heard constant foraging and feeding but not seen, 4 passes. Foraging alongside treeline, 1 pass
1 end	20:58	-	-
-	20:58	-	Ecologists ceased observations
Date	13/10/2020		
Temp	13.0°C at start and 10.0°C at the end		
Weather	Light rain at start, overcast and with a calm air (Beaufort scale 0)		
Ecologists	Calum Cooper & Darla Brown		
Listening point	Time	Species	Observation
-	18:16	-	Ecologists commenced observations
1 start	18:16	-	-
-	18:17	-	Sunset
-	-	Soprano pipistrelle	Heard but not seen, 1 pass
1 end	18:19	-	-
-	-	Soprano pipistrelle	Heard but not seen, 2 passes
-	-	Common pipistrelle	Heard but not seen, 1 pass
2 start	18:21	-	-
2 end	18:24	-	-
3 start	18:27	-	-
3 end	18:30	-	-
4 start	18:33	-	-
4 end	18:36	-	-
5 start	18:39	-	-
5 end	18:42	-	-
-	-	Common pipistrelle	Heard but not seen, 2 passes
6 start	18:46	-	-
-	-	Common pipistrelle	Heard but not seen, 4 passes
6 end	18:49	-	-
7 start	18:51	-	-
7 end	18:54	-	-
8 start	18:55	-	-
-	-	Serotine	Heard but not seen, 1 pass. One seen commuting north through the trees
-	-	Common pipistrelle	Heard but not seen, 1 pass
8 end	18:57	-	-
-	-	Pipistrelle species	Heard but not seen, 1 pass

-	-	Common pipistrelle	Heard but not seen, 2 passes
9 start	19:05	-	-
9 end	19:08	-	-
10 start	19:10	-	-
10 end	19:13	-	-
11 start	19:15	-	-
11 end	19:18	-	-
12 start	19:20	-	-
-	-	Common pipistrelle	Heard but not seen, 1 pass
12 end	19:23	-	-
13 start	19:26	-	-
-	-	Common pipistrelle	Heard but not seen, 4 passes. Heard feeding but not seen, 1 pass
-	-	Soprano pipistrelle	Heard but not seen, 1 pass
13 end	19:29	-	-
-	-	Common pipistrelle	Heard but not seen, 1 pass
14 start	19:31	-	-
-	-	Pipistrelle species	Heard but not seen, 1 pass
14 end	19:34	-	-
15 start	19:35	-	-
-	-	Common pipistrelle	Heard but not seen, 2 passes
15 end	19:38	-	-
-	19:38	-	Ecologists ceased observations