

MKA
ECOLOGY

Bat Activity Survey report

Land East of Walnut Tree, Pirton
Hertfordshire

Site	<i>Land East of Walnut Tree Road, Pirton</i>
Project number	<i>163024</i>
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Version number	Date of issue	Revisions
<i>1.0</i>	<i>21 April 2026</i>	<i>Original</i>
<i>2.0</i>	<i>01 June 2026</i>	<i>Minor text amendments following client comments</i>

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Declaration of compliance

The Bat Activity Survey has been undertaken in accordance with British Standard 42020:2013 'Biodiversity, Code of practice for planning and development'. The information which we have provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.



We are a Chartered Institute of Ecology and Environmental Management (CIEEM) Registered Practice. All of our ecologists are members of CIEEM and between them carry licences for the majority of protected species.

Validity of data

For sites that require a European Protected Species Licence in respect of bats, the licensing authority in England (Natural England) will expect data from the most recent survey season. The information about non-roosting bat activity provided within this report is valid for a maximum period of 18 months from the date of survey. If works at the site have not progressed by this time an updated site visit may be required in order to determine any changes in site composition and ecological constraints.

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1. EXECUTIVE SUMMARY

In March 2025 MKA Ecology Ltd was commissioned to undertake Bat Activity Surveys at Land East of Walnut Tree, Pirton. The purpose of the survey was to identify the bat species' present and their use of the Site.

The Site currently comprises modified grassland, bramble scrub, hardstanding, buildings, rural trees, a line of trees and species-rich native hedgerows with trees, and covers a total of 3.05 hectares. The proposed development involves the construction of 50 residential dwellings with associated access, parking facilities, gardens and landscaping. Proposed habitats also include a pond, native tree planting, grassland, mixed scrub, and species-rich native hedgerows.

A series of Bat Activity Surveys were undertaken between May and September 2025 comprising three transect and vantage point surveys and six automated static bat detector surveys.

A total of at least eight different species were, recorded qualifying the Site as Regionally significant. The presence of barbastelle is particularly significant, as this is one of the rarest species in the UK, and it is also susceptible to development impacts such as artificial lighting. *Myotis* sp. and brown long-eared bat were also recorded and are also particularly sensitive to artificial lighting. The majority of recorded activity was from common pipistrelle, followed by soprano pipistrelle; while these species were widespread across all transect and static recording locations, there were some apparent trends whereby many of the scarcer species – most notably barbastelle, serotine, noctule, *Nyctalus* sp. and *Myotis* sp. - had records concentrated at the northern and southern boundaries, with reduced abundance in the central part of the Site and the bisecting hedgerow.

The preliminary plans propose to retain the majority of the important linear features, except for a section of hedgerow bisecting the Site (0.194km lost of 0.243km). Alternative commuting pathways and foraging habitat will be provided post development: new species-rich hedgerows, trees, a pond, mixed scrub, and grassland are being proposed as compensation, as well as enhancing the lower condition lines of trees and species-rich native hedgerows.

A sensitive lighting strategy must be implemented for both the construction and operational phases of the proposed development following guidance from the Institute of Lighting Professionals to ensure alternative commuting and foraging habitat will be utilised by the light-averse species recorded on-site.

The provision of bat roosting features will offer the opportunity to improve the site for roosting bats; it is recommended that a bat box scheme is developed at the detailed planning stage and this should include integrated/wall mounted boxes on the proposed new buildings as well as boxes mounted on the trees across the Site.

2. INTRODUCTION

2.1. Aims and scope

In March 2025, MKA Ecology Ltd was commissioned to undertake Bat Activity Surveys at Land East of Walnut Tree Road, Pirton by Blakeney Estates Ltd in order to support a planning application for a proposed development of up to 50 residential dwellings. The survey was commissioned following a recommendation in the Preliminary Ecological Appraisal (MKA Ecology Ltd, 2025a).

The aims of the Bat Activity Survey were to:

- Complete three walkover and vantage point surveys, as well as six automated static bat detector surveys;
- Identify the assemblage of bat species present and level of bat activity throughout the Site;
- Locate any key foraging and commuting areas;
- Assess the impacts of the proposed development on bat activity; and
- Detail recommendations for mitigation and propose any suitable habitat enhancements for bat species, if required.

This report must be read in conjunction with the Preliminary Ecological Appraisal (MKA Ecology Ltd, 2025a). With respect to bats, this report supersedes the findings and recommendations given in said report.

2.2. Site description, context, and previous survey effort

The survey area is shown on the map in Figure 1. Within this report this area is referred to as the Site or Land East of Walnut Tree Road. The Site is located in Pirton, Hertfordshire (centred on TL 15110 31550) and measures approximately 3.05ha. The Site has two modified grassland fields with bramble scrub, rubble piles, and derelict structures, bordered by native species-rich hedgerows and trees. Surrounding areas include agricultural fields, residential areas, and a recreation ground.

The hedgerows and line of trees provide strong linear features that connect to the wider environment and provide habitat for foraging and commuting bat species on-site and within the wider landscape.

The wider landscape comprises a mosaic of arable land, grassland, and pockets of woodland with intersecting hedgerows and lines of trees. Hambridge Way road runs adjacent to the northern Site boundary beyond which are residential properties, which are present in the west. The eastern boundary adjoins a complex of arable fields. To the south, the Site is bordered by a recreation ground.

The data search completed during the Preliminary Ecological Appraisal (MKA Ecology Ltd, 2025a) returned three European Protected Species Licences granted for destruction of a common pipistrelle non-breeding roost (licence period November 2010 – September 2011), destruction of a brown long-eared bat, common pipistrelle, Natterer's bat, and soprano pipistrelle breeding roost (licence period: November 2018 – January 2024), and destruction of a common pipistrelle and brown long-eared bat breeding roost (licence period April 2010 – September 2011). These licenses were granted within 1km west of the Site. Overall, the data search shows that a good diversity of bat species has been recorded in the local area, including species that are known to roost in buildings such as pipistrelle species and brown long-eared bat, and species that are known to roost in trees including pipistrelle species and noctule.

No potential roosting features were identified during the Preliminary Ecological Appraisal in the trees present within the hedgerow on-site (MKA Ecology Ltd, 2025a), and a Preliminary Roost Assessment (MKA Ecology Ltd, 2025b) undertaken of the buildings on-site found no direct evidence of roosting bats due to a lack of suitable features.

Overall, the Site has been assessed as having **moderate** suitability for foraging and commuting bats and **low** potential to support roosting bats.

2.3. Proposed development

The proposed development involves the construction of 50 residential dwellings with associated access roads and landscaping. The initial Site plan for Land East of Walnut Tree Road, Pirton is presented in Figure 2. Proposed habitats include retaining the species-rich native hedgerows with trees at the northern, eastern and southern boundaries, retaining the line of trees at the southwestern boundary, enhancing a section of the existing species-rich native hedgerow with trees that is to be retained at the centre of the Site, the creation of other neutral grassland, modified grassland, mixed scrub, species-rich native hedgerows, species-rich native hedgerows with trees, buildings, hardstanding, vegetated gardens, a pond and native tree planting.

2.4. Legislation and planning policy

This Bat Activity Survey has been undertaken with reference to relevant wildlife legislation and planning policy. Relevant legislation considered within the scope of this document comprised the following:

- The Environment Act 2021;
- The Wildlife and Countryside Act 1981;
- The Conservation of Habitats and Species Regulations 2017; and
- The Natural Environment and Rural Communities (NERC) Act 2006.

In addition to obligations under wildlife legislation, the revised National Planning Policy Framework (NPPF) updated on 12 December 2024 requires planning decisions to contribute to conserving and enhancing the local environment. Further details are provided in Appendix 1.

North Herts Council has produced an adopted Local Plan which covers a number of policies relating to biodiversity and habitat conservation, including:

Policy SP1: Sustainable development in North Hertfordshire

Grant planning permission for proposals that, individually or cumulatively: (iv) protect key elements of North Hertfordshire's environment including biodiversity, important landscapes, heritage assets and green infrastructure (including the water environment); and (v) secure any necessary mitigation measures that reduce the impact of development, including on climate change.

Policy SP9: Design and Sustainability

Require Strategic Masterplans and planning applications for Strategic Housing Sites and significant development to (as applicable):

(vi) create and accessible multi-functional green infrastructure network that provides: a high-quality integrated network to support ecological connectivity, biodiversity net gain, climate adaptation and mitigation linking into the wider Ecological Network.

Policy SP12: Green infrastructure, landscape and biodiversity

States that it will accommodate significant growth during the plan period whilst ensuring the natural environment is protected and enhanced and will:

- a) Protect, identify, manage and where possible enhance a strategic multi-functional network of green infrastructure;
- b) Consider and respect landscape character, scenic beauty and locally sensitive features, particularly in relation to the Chilterns Area of Outstanding Natural Beauty;
- c) Protect, enhance and manage designated sites in accordance with the following hierarchy of designations and features:
 - Internationally designated sites
 - Nationally designated sites
 - Locally designated sites;
 - Non-designated sites that include important habitats and species
- d) Protect, enhance and manage biodiversity networks including wildlife corridors, ancient woodlands and hedgerows, wetland and riverine habitats, Local Geological Sites, protected

species, priority species and habitats, and non-designated sites of ecological value and ensure measurable net gains for biodiversity;

e) Protect other open spaces and support provision of new and improved open space.

Further details are provided in Appendix 1. Where relevant these are discussed in further detail in Section 5.

Figure 1: Site location for Land East of Walnut Tree, Pirton



3. METHODOLOGIES

3.1. Survey requirements and survey effort

The design of the survey was informed by the results of the Preliminary Ecological Appraisal (MKA Ecology Ltd, 2025a). The Site was assessed as holding moderate suitability for commuting and foraging bats due to the presence of tall and dense hedgerows interspersed with trees which are part of a much larger network of similar linear features in the wider landscape that lead to parcels of higher-quality woodland habitat.

For habitats of moderate suitability for bats, good practice guidelines recommend one walked transect survey per season (spring – April/May, summer – June/July/August, autumn – September/October) and automated detector surveys to be completed each month (between April and October), for a minimum of five consecutive nights per season in appropriate (or the best available) weather conditions for bats (Collins, 2023).

3.2. Vantage point and transect survey

Vantage point and transect surveys were undertaken at the proposed development site to establish:

- Which bat species are using the Site and activity levels for each;
- Key foraging areas;
- Key commuting routes; and
- Relative levels of activity across the survey area.

Two surveyors were positioned at vantage points, located in different areas across the Site for each survey commencing at sunset for 30 minutes. The vantage point survey effort, targeting areas of suspected high-quality habitat around the Site, was undertaken for 30 minutes opposed to the full hour as no bats were recorded during this time period and it became too dark for the surveyors to see bats. The vantage point surveys were undertaken to provide information about the behavior of early-emerging, high and fast flying bats. The vantage point locations are shown in Figure 2.

The transect route was designed to survey key features for bats and habitats that could be impacted by the proposed development. Habitats included in the transect route were the species-rich native hedgerow with trees, line of trees, and modified grassland. The transect surveys started at a different location along the route each time to allow for each section of the route to be surveyed at different time periods in relation to sunset. The route, starting points, vantage points and listening stops are shown in Figure 2. The transect was walked at a steady pace allowing good coverage of all key habitats, and commenced 30 minutes after sunset (upon completion of the vantage point surveys).

All bat passes, including information on time and species, were recorded on standard activity survey recording forms and a base map of the Site. Where possible the behaviour of the bat was also recorded, including direction of flight, distance from feature, and type of behaviour. Foraging behaviour was identified and social calls indicated communication between bats. The start and finish time of each transect, date, name of recorder, detector type, wind direction and force, temperature, precipitation and cloud cover were also recorded.

Surveyors used full spectrum bat detectors (Elekon Batlogger M) with integrated digital recording and GPS. Sound recordings were later analysed using Kaleidoscope Pro software. Identification of bat calls was undertaken using the parameters set out by Russ (2012).

The dates and prevailing weather conditions of the surveys are shown in Table 1 below.

Table 1: Transect survey dates and weather conditions

Date of each survey visit	Start and end times, sunset/sunrise times	Weather*
08/05/2025 (Spring)	Vantage point start: 20:38 Transect start: 21:08 Sunset: 20:38 End: 22:38	Start temp: 10°C End temp: 7°C Precipitation: None Wind: 3 Cloud cover: 0/8
Comment: 2 surveyors		
10/07/2025 (Summer)	Vantage point start: 21:19 Transect start: 21:49 Sunset: 21:19 End: 23:19	Start temp: 23°C End temp: 21°C Precipitation: None Wind: 3 Cloud cover: 1/8
Comment: 2 surveyors		
01/09/2025 (Autumn)	Vantage point start: 19:48 Transect start: 20:18 Sunset: 19:48 End: 21:48	Start temp: 21°C End temp: 16°C Precipitation: None Wind: 3 Cloud cover: 6/8
Comment: 2 surveyors		

*Wind as per Beaufort Scale / Cloud cover given in Oktas.

3.3. Automated static bat detector survey

Automated static detector surveys were completed in May, June, July, August, September and October. This involved Anabat Express automated static bat detectors being deployed in three locations for a minimum of five consecutive nights in each session. The locations at which the automated static bat detectors were deployed are shown in Figure 2. Detectors were placed in locations to provide a representative sample of habitats at the Site that could be impacted by the proposed development. These habitats are the species-rich native hedgerows with trees and lines of trees. Automatic static bat detectors were positioned in the same locations for each recording session.

Sound analysis was completed by suitably qualified ecologists using Kaleidoscope Pro software and bat call parameters from Russ (2012). The sound analysis involved the use of the auto identification function and manual review of a predetermined percentage of the recordings. This was at least 10% of noise recordings, 10% of pipistrelle recordings, and 100% of all other bat recordings. The Anabat Express is activated by high frequency bat calls which trigger a maximum 30 second recording. For the purposes of analysis, a bat pass correlates to a single recording.

The dates and prevailing weather conditions for the monitoring sessions are shown in Table 2, below.

Table 2: Dates for automated static bat detector monitoring sessions and prevailing weather conditions

Session	Dates	Weather description*
1	10 May - 14 May (5 nights)	Overall: Good Average night-time temperatures: 9°C Average night-time wind speed: 5mph Precipitation: 0mm
2	08 June - 11 June (5 nights)	Overall: Good Average night-time temperatures: 13°C Average night-time wind speed: 9mph Precipitation: 0mm
3	01 - 05 July (5 nights)	Overall: Good Average night-time temperatures: 22°C Average night-time wind speed: 8mph Precipitation: 5mm
4	21 – 25 August (5 nights)	Overall: Good Average night-time temperatures: 18°C Average night-time wind speed: 9mph Precipitation: 0mm

Session	Dates	Weather description*
5	01 – 05 September (5 nights)	Overall: Good Average night-time temperatures: 15°C Average night-time wind speed: 9mph Precipitation: 5mm
6	07 – 11 October (5 nights)	Overall: Good Average night-time temperatures: 11°C Average night-time wind speed: 6mph Precipitation: 0mm

3.4. Surveyors, author and reviewer

The bat transect surveys were undertaken by:

- Suzanne Dry ACIEEM, Consultant Ecologist at MKA Ecology Ltd. Suzanne has over five years' experience undertaking Bat Activity Surveys.
- Alfie Bunting, Consultant Ecologist at MKA Ecology Ltd. Alfie has four years' experience undertaking Bat Activity Surveys.
- Joe Gillis, Ecologist at MKA Ecology Ltd. has two years' experience undertaking Bat Activity Surveys.
- Maddy Grove, Ecologist at MKA Ecology Ltd. Robin has over one years' experience undertaking Bat Activity Surveys.

Bat call analysis was completed by the following ecologists:

- Hannah Wallace, Ecologist at MKA Ecology Ltd with over two years' experience carrying out bat sound analysis
- Alisa Davies, Ecologist at MKA Ecology Ltd with over two years' experience carrying out bat sound analysis

The report was written by Joe Gillis, Ecologist at MKA Ecology Ltd, and has been reviewed by India Wedge ACIEEM, Senior Ecologist at MKA Ecology Ltd. India has six years' experience as an ecological consultant and holds a Level 1 Bat Licence from Natural England. The report was authorised by Marielle James MCIEEM. Marielle has over 10 years' of experience as an ecological consultant and holds a level 2 Bat Licence from Natural England.

3.5. Constraints

The results taken from bat detector recordings are biased towards bats that use louder echolocation calls. Some species, such as brown long-eared bat, are known to echolocate quietly on occasions. Therefore, some species may be under recorded due to the limited recording range of the equipment. This is particularly evident during the automated static bat detector surveys where there is no surveyor to record visual cues for these species.

Some groups of bat species use echolocation calls of a very similar structure. These similar calls make identification through call analysis difficult, particularly in cluttered environments where positive identification is often impossible to achieve. In cases where the bat cannot be confidently identified to species level it is identified to genus level, such as *Myotis* sp. Similarly, it can be difficult to distinguish between common pipistrelle and soprano pipistrelle due to a certain degree of overlap in call structure. In this instance the call is described as *Pipistrellus* sp. This should not be taken as a description of other pipistrelle species, particularly Nathusius' pipistrelle which, where thought to be present, are directly referenced. Similar overlap of calls applies to the genus *Nyctalus* (noctule and Leisler's bat *N.leisleri*).

Acoustic surveys allow representative sampling of bat activity across the site which facilitates an understanding of species presence and patterns of activity. However, the measurements of activity can only be used to provide an index of activity and cannot be used to determine absolute abundance of bats using the site. Therefore, the number of bat passes encountered cannot be used to determine numbers of individuals present. The results of the survey can only be taken as an assessment of the risk of there being high concentrations of bats within the Site or around particular habitat features and provide an indication of how bats are using the available habitats.

In June, Static 2 located in the north-east corner of the Site only recorded for the first two days of being deployed due to equipment failure. In August, Static 1 (south-east corner) didn't record any data also due to equipment failure. In September, Static 2 was stolen and therefore all data was lost for this month in this location. The loss of data is considered to be a constraint on the dataset as several days of data has been missed for Static 2 repeatedly. As a result, a precautionary approach has been taken in respect of the results and mitigation for this development.

Bat Activity Surveys were not undertaken in the month of April. This is not thought to pose a significant constraint upon the results or alter any conclusions, however, the transitional activity emerging from hibernation sites to more active feeding has been missed and therefore such activity cannot be informed against in terms of mitigation. As with Static 2, a precautionary approach to mitigation has therefore been taken.

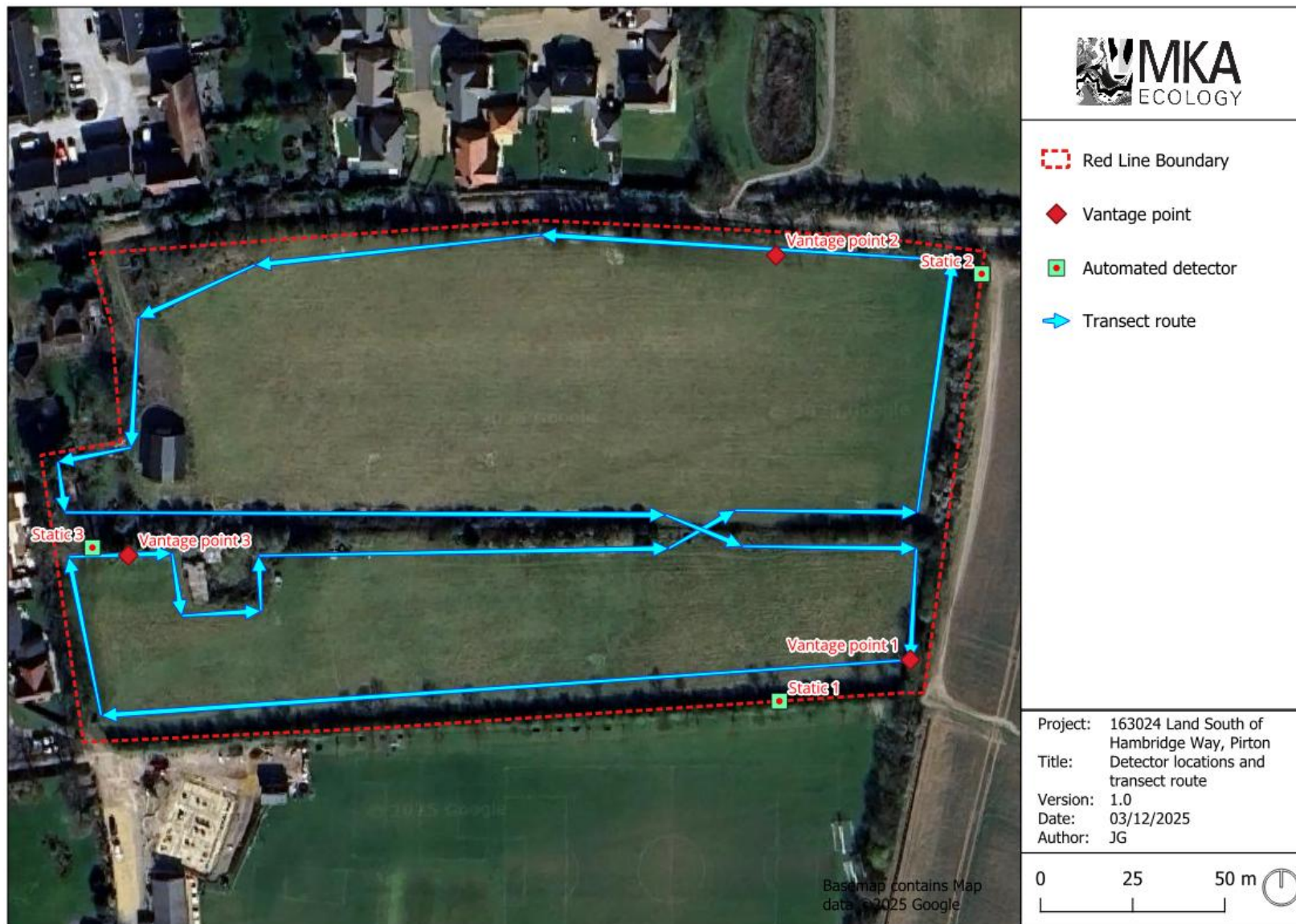
3.6. Assessment for bats

The guidelines for categorisation of bats in England by distribution and rarity, and level of importance if roost type (adapted from Reason and Wray, 2025) are shown in the tables below.

Table 3: Categorising bats by rarity (South-eastern/East Anglia to The Wash)

Rarity within England	Species
Rarest Annex II species and very rare	- Alcathoe's bat <i>Myotis alcathoe</i> - Barbastelle <i>Barbastella barbastellus</i>
Rarer or restricted distribution	- Whiskered bat <i>Myotis mystacinus</i> - Brandt's bat <i>Myotis brandtii</i> - Serotine <i>Cnephaeus serotinus</i> - Leisler's bat <i>Nyctalus leisleri</i> - Nathusius' pipistrelle <i>Pipistrellus nathusii</i>
Widespread in many geographies, but not as abundant in all	- Daubenton's bat <i>Myotis daubentonii</i> - Natterer's bat <i>Myotis nattereri</i> - Noctule <i>Nyctalus noctula</i>
Widespread	- Common pipistrelle <i>Pipistrellus pipistrellus</i> - Soprano pipistrelle <i>Pipistrellus pygmaeus</i> - Brown long-eared bat <i>Plecotus auritus</i>

Figure 2: Map of vantage point survey locations, transect routes, and automated static bat detector locations



4. RESULTS

4.1. Vantage point survey

No bats were directly observed by surveyors or recorded on the Elekon Batlogger M detector during the vantage point surveys.

4.2. Bat transect survey

Foraging and commuting bats

During the bat transect surveys at least three species were recorded, although overall activity levels were low. Common pipistrelle was the most frequently recorded species and was recorded on all three survey visits (see Figure 5 and Table 4). Soprano pipistrelle and barbastelle were the second most common species, although only recorded once during the survey effort (see Figure 4). No bats were recorded during the May survey effort; common pipistrelle was otherwise recorded at low activity levels during July and September. Soprano pipistrelle was only present in July, and barbastelle was only present in September.

Table 4: Summary of total passes for each species during transect survey visits

Visit	Common Pipistrelle	Soprano pipistrelle	Barbastelle	Total	% of Total passes
1 (May)	0	0	0	0	0
2 (July)	22	1	0	23	47
3 (September)	25	0	1	26	53
Total	47	1	1	49	100
% of total passes	96	2	2	100	

Temporal distribution of activity

The temporal pattern of bat activity showed similar levels of activity in the July and September surveys, with 53% and 47% of all bat passes respectively which was almost entirely due to common pipistrelle passes (accounting for 96% of all detections across the survey effort). No bat activity was detected in May. While it is expected that bat activity is lower in May in comparison to the peak seasons of July and September, the complete absence of bat records is likely to be attributed to the relatively low temperature at the time of the survey (see Table 1). Three out of the five survey nights were below 10°C. Limited bat activity is said to occur below 10°C (Slack and Tinsley, 2015).

Spatial distribution of activity

Due to the absence of bat records in May and the low sample size in general, it is difficult to draw robust conclusions from the dataset produced as a result of the survey effort. However, bat activity recorded at the Site could be interpreted as showing similar levels of utilisation for the hedgerows and lines of trees on-site, except for the hedgerow along the northern boundary, of which only a few passes were recorded (see Figure 3). Species diversity, however, was highest along the northern and southern boundaries, although only with the additions of one soprano pipistrelle pass and one barbastelle pass for each location respectively (see Figure 4). Common pipistrelle had the most widespread distribution across the Site while other bat species such as soprano pipistrelle and barbastelle are locally distributed. The relative activity of each species is summarised graphically in Figures 3-5 below.

Figure 3: Relative bat activity map based on transect results – all species



Figure 4: Bat survey transect results – species distribution



Figure 5: Relative bat activity map based on transect results – Common pipistrelle



4.3. Automated static bat detector survey

A total of 12,101 bat passes were recorded during the automated static bat detector surveys. The same species found during the transect surveys were also recorded during these sessions, with the addition of noctule, Nathusius' pipistrelle, serotine, and brown-long eared bat.

Table 5: Number of species passes recorded by the automated static bat detector surveys

Visit	Common pipistrelle	Soprano pipistrelle	<i>Pipistrellus</i> sp.	Serotine	Noctule	<i>Myctalus</i> sp.	Brown long-eared bat	Barbastelle	Nathusius' pipistrelle	<i>Myotis</i> sp.	Total
May - Static 1	103	0	13	3	0	2	0	22	15	27	185
May - Static 2	476	0	0	0	0	0	0	4	0	0	480
May - Static 3	384	10	0	0	0	0	2	0	0	0	396
June - Static 1	130	2	0	0	0	0	1	0	0	0	133
June - Static 2	14	0	0	0	0	0	0	0	0	0	14
June - Static 3	718	0	0	0	0	1	0	1	13	2	735
July - Static 1	1,072	0	0	0	0	1	0	0	0	9	1,082
July - Static 2	378	0	0	0	0	0	0	0	0	0	378
July - Static 3	331	19	0	0	0	0	0	0	0	0	350
August - Static 1	-	-	-	-	-	-	-	-	-	-	0
August - Static 2	3,329	610	0	7	25	13	5	26	4	20	4,039
August - Static 3	1,893	63	0	3	3	7	34	5	0	6	2,014
September - Static 1	649	14	0	0	2	0	17	28	0	16	726
September - Static 2	-	-	-	-	-	-	-	-	-	-	0
September - Static 3	894	33	0	0	2	0	5	0	0	2	936
October - Static 1	328	0	0	1	7	34	0	17	0	9	396
October - Static 2	63	0	0	0	0	0	0	0	0	0	63
October - Static 3	165	6	0	0	0	0	3	0	0	0	174
Total	10,927	757	13	14	39	58	67	103	32	91	12,101
% of total passes	90.30	6.26	0.11	0.12	0.32	0.48	0.55	0.85	0.26	0.75	

Common pipistrelle was the most frequently recorded species by a significant margin, accounting for 90.3% of all passes, followed by soprano pipistrelle accounting for 6.26% of all passes. The proportion of common and soprano pipistrelle bat passes are similar to that of the transect surveys (see Table 4). Barbastelle, *Myotis* sp., and brown long-eared bat results show a similar number of passes in total accounting for 0.85%, 0.75%, and 0.55% respectively. The remaining species (*Pipistrellus* sp., *Nyctalus*

sp., serotine, and Nathusius's pipistrelle) recorded a very low number of passes accounting for the remaining 1.29% of all passes.

The highest levels of general bat activity (6,053 passes) were recorded in August. This is despite one of the three statics failing (see Section 3.5). The next highest month for general bat activity was July with 1,810 passes from three statics, followed by the month of September recording 1,662 passes from two statics (see Section 3.5). The lowest levels of bat activity occurred in the month of October recording 633 passes.

Common and soprano pipistrelle activity peaked in August. Common pipistrelle showed consistently moderate to high activity throughout the survey period, whereas soprano pipistrelle recorded moderate activity only in August and low to very low activity in other months. Brown long-eared bat and noctule activity was also highest in August (and September for brown long-eared bat), although overall pass numbers were low.

Activity for barbastelle, *Nyctalus* sp. and *Myotis* sp. peaked in August; barbastelle and *Myotis* sp. also showed similar activity levels in May and September, while *Nyctalus* sp. additionally peaked in October. Nathusius's pipistrelle activity showed peaks in May and June. Serotine was recorded infrequently throughout, with a slight peak in August.

The results show temporal variation in the diversity of species across the different survey months. With May (at least eight species), June and October (at least seven species), and August (at least eight species) surveys yielding the highest diversity. July (at least four species), and September (at least six species) recorded the lowest diversity across the survey effort.

The results from Table 5 reinforces that there is a widespread distribution of bats with similar levels of activity throughout the different survey months and across the three statics. While Static 1 recorded almost half the number of bat passes (2,522) compared to Static 2 (4,974) and Static 3 (4,605), this may be mostly attributable to the equipment failure resulting in no bat passes being recorded for Static 1 in August, the most active survey month (see Section 3.5).

The most numerous species, common pipistrelle, was widespread in all three static locations, with 4,385 passes at Static 3 (where central hedgerow meets the western boundary), 4,260 at Static 2 (in the northeast corner), and 2,282 at Static 1 (located near the southeast corner of the Site along the southern perimeter hedgerow), although the latter figure is likely affected by the missing August data. Soprano pipistrelle was most frequent at Static 2 (610 passes), followed by Static 3 (131 passes) and Static 1 (13 passes). It may too have been affected by the missing Static 1 data from August. Static 1 recorded the most barbastelles in total (66 passes), compared with 30 at Static 2, and just six at Static 3. The largest number of brown long-eared bat passes (44) were at Static 3, followed by 18 at Static 1 and five at Static 2 (although both Statics 1 and 2 missed recording sessions which may have impacted totals).

Noctule had 25 passes at Static 2, nine at Static 1 and five at Static 3. Low numbers of Nathusius's pipistrelle were recorded, comprising 15 passes at Static 1, 13 at Static 3 and four at Static 2. Serotine activity was very low and spread between all three static locations. Among records not identifiable to species level, *Myotis* sp. were most numerous at Static 1 (61 passes, followed by Static 2 (20 passes) and Static 3 (ten passes). Unidentified *Nyctalus* sp. (noctule or Leisler's bat) were at Static 1 (37 passes), Static 2 (13 passes) and Static 3 (eight passes), and 13 passes of unidentified pipistrelles were at Static 1.

Figure 6: Commuting and foraging areas for bats at Land East of Walnut Tree Road, Pirton



5. EVALUATION AND RECOMMENDATIONS

The following evaluation and recommendations are based on the Bat Activity Survey carried out at Land East of Walnut Tree Road, Pirton between May and October 2025.

5.1. Evaluation

A total of at least eight different species were recorded at the Site, with recordings from one genus (*Myotis* sp.) only identified to genus level. *Pipistrellus* sp. and *Nyctalus* sp. were also only identified to genus level for certain calls. This is considered to be a moderate diversity of species for this region, accounting for 66% of the species known to exist in Hertfordshire (12 different species in total). These species, together with their perceived rarity (Reason and Wray, 2025) and the frequency at which they were encountered, are shown in Table 6 below.

Table 6: Species, perceived rarity and frequency of encounter at Land East of Walnut Tree Road, Pirton

Species	Rarity	Activity levels
Common pipistrelle	Widespread	High
Soprano pipistrelle	Widespread	Moderate
Nathusius's pipistrelle	Rarer or restricted distribution	Low
Serotine	Rarer or restricted distribution	Low
Barbastelle	Rarest Annex II species and very rare	Very low
Noctule	Widespread in many geographies, but not abundant in all	Very low
<i>Nyctalus</i> sp.	Widespread in many geographies, but not abundant in all	Very low
Brown long-eared bat	Widespread	Low
<i>Myotis</i> sp.	Widespread in many geographies, but not abundant in all*	Very Low

* Rarity is assessed at species level, this represents the range for these genera. Whilst some *Myotis* species are considered within the 'Rarer' or 'Rarest' category, the Site is outside of their known distributions.

A points system detailed in Reason and Wray (2025) can be used to assess the importance of a site based on its bat assemblage, this is detailed in Table 7 below.

Table 7: Assessing the importance of a bat assemblage (Reason and Wray, 2025)

Rarity category (points/species)	Species – South-eastern/East Anglia to The Wash	
Widespread all geographies (score 1)	Common pipistrelle Soprano pipistrelle Brown long-eared bat	Score 1 each
Widespread in many geographies but not as abundant in all (score 2)	<i>Myotis</i> species† Noctule	Score 2 each
Rarer or restricted distribution (score 3)	Serotine Nathusius's pipistrelle	Score 3 each
Rarest Annex II and very rare (score 4)	Barbastelle	Scores 4
Total score		17
Thresholds		
County importance threshold: 45%	County	13
Regional importance threshold: 55%	Regional	15
National importance threshold 70%	National	20

† Whilst no *Myotis* were recorded to species level, it is assumed that the most common species of this genus were present: Daubenton's bat and Natterer's bat, each scoring two points. Further justification is provided below.

The species recorded during the Bat Activity Survey led to the Site scoring at least 17. As some species were not identifiable to species level, an exact score cannot be derived. This score is at least at the threshold of what Reason and Wray (2025) determine to be a site of regional importance. This is due to the presence of serotine and Nathusius' pipistrelle being recorded which are in the rarer category coupled with the recording of barbastelle, which is within the rarest category.

The data from the transect surveys and the static detector surveys shows the Site is used by a range of bat species, dominated by common pipistrelle but with occasional use by rarer species such as serotine and barbastelle.

While common and soprano pipistrelles appeared widespread across all static recording locations (assuming that records from Static 1 were affected by the missing August data), there were apparent spatial patterns observed within the less frequent species. Static 1 in the southeast corner, recorded the largest numbers of barbastelle, Nathusius's pipistrelle, *Myotis* sp, *Nyctalus* sp. and unidentified pipistrelles, while Static 2 in the northeast corner recorded most serotine and noctule. Static 3, near the

western end of the central hedgerow, recorded the highest activity of brown long-eared bat largely due to a concentration of records made during August, but was generally less used by the scarcer species, recording the lowest numbers of serotine, noctule, *Nyctalus* sp., barbastelle and *Myotis* sp, despite a full set of static data being available.

Thus while the spatial distribution of bats did not significantly vary across the Site, with detectors showing a widespread distribution of species and activity levels across both transect surveys (see Figure 4) and automated detector surveys (see Table 5), there are some apparent trends whereby most scarcer species had records concentrated at the northern and southern boundaries. A map outlining the commuting and foraging areas for bats is shown in Figure 6. The hedgerows and lines of trees situated at the boundaries of the Site as well as the hedgerow bisecting the Site at its centre have been identified as important areas for the Site's bat assemblage.

Very low levels of activity from unidentified *Myotis* species were recorded. The *Myotis* species which are most likely to be recorded in Hertfordshire are Daubenton's bat and Natterer's bats due to their abundance of records and county wide distribution. No *Myotis* species were identified to species level, as this is not often possible, although the known distribution of the species within this genus within Hertfordshire and the available habitat on-site and the surrounding area suggests that Daubenton's bat and Natterer's bat could both forage locally. Other *Myotis* species that could be recorded include Brandt's bat and whiskered bat, but both species have limited and restricted distributions in Hertfordshire and the South-east / East Anglia as a whole. There are no known records of whiskered bat or Brandt's bat roosts within Hertfordshire. These species are considered to be within the rarer/restricted distribution category, and would elevate the score, inclusive of the above additions, to 22, although this is considered unlikely for the reasons discussed above.

Leisler's bat are classified as a 'rarer' species within the South-east and East Anglia (see Table 3). Very low levels of *Nyctalus* sp. were recorded on-site. Leisler's bat are typically associated with woodland and could utilise the surrounding woodland habitats and hedgerows on-site as a commuting and foraging resource. The inclusion of Leisler's bat would elevate the Site's importance to a Nationally significant level; scoring a total of 20 (see Table 7).

The survey is notable for the presence of barbastelle, one of only four UK bat species listed on Annex II of the European Habitats Directive. Barbastelle activity was very low but widespread across the Site. Barbastelle were predominantly recorded at Static 1 and Static 2 with only six barbastelle passes recorded at Static 3. Barbastelles require mature deciduous woodlands and riparian corridors, with foraging occurring typically over water and in woodland habitats. The proximity of the Site to suitable aquatic and woodland habitat within 1km may explain this species' presence on-site. Furthermore, barbastelle bats are sensitive to artificial lighting and will actively avoid intensively artificial illuminated areas. The linear features onsite may act as important commuting corridors linking roosts to suitable foraging habitat on-site and within the wider landscape.

5.2. Impacts in the absence of mitigation

In the absence of mitigation there are a number of impacts which this development may have on bats. These are described below followed by recommendations for mitigation.

Habitat loss

The key features for bat species at the Site lie largely in the value of native hedgerows bordering and bisecting the Site of which have been identified as important commuting corridors for rare bat species as well as the entire Site assemblage. The proposed development will result in the removal of one of these commuting and foraging resources, and the potential encroachment on others, diminishing the value of the Site for bats in the absence of appropriate mitigation. Due to the loss of the native hedgerow bisecting the Site (assessed as a commuting route, see Figure 6) which showed similar levels of bat activity to the other hedgerows over the survey effort (although used primarily by common pipistrelle and with fewer records of scarcer species such as barbastelle), as well as development potentially encroaching within approximately 4m of the southern hedgerow, loss and fragmentation of commuting corridors on-Site is anticipated under the preliminary landscaping plans.

Lighting

Much of the extent of the Site is under relatively low luminosity at baseline, as it consists of tall dense boundary hedgerows situated next to large agricultural fields to the east and a recreational field to the south. It is therefore likely to act as an important dark resource for bats in itself as well as in the wider landscape. An increase in artificial lighting as a result of the proposed development in addition to the loss of the bisecting native hedgerow is the major threat to bat populations at this Site in the absence of mitigation. Artificial lighting is known to have detrimental impacts on bat activity; lighting can create barriers to commuting routes and cause bats to avoid certain well-lit areas (ILP, 2023). If a high intensity lighting scheme was incorporated in the final design, with light spill onto the boundary hedgerows, trees, new pond, and line of trees, and enhanced grassland, then there would be detrimental impacts to bat activity at an immediate level as bats would not be able to utilise alternative commuting pathways.

5.3. Recommendations

Habitat loss and lighting

The network of lines of trees and native hedgerows highlighted in Figure 6 are important features for commuting and foraging bats, supporting a regionally significant assemblage of bat species, and must be retained where possible.

The preliminary plans propose to remove the hedgerow bisecting the Site, as well as development encroaching within 4m of the southern hedgerow. Consequently, a commuting feature (the central hedgerow) will be lost. However, this hedgerow was identified to be largely utilised by common pipistrelle, a species which is widespread and common and also less light-sensitive than other species

of bat such as *Myotis* sp., brown long-eared bat and barbastelle. In addition, the suitability of the retained southern hedgerow may be affected by the close proximity of the development.

High-quality alternative foraging and commuting habitats are being proposed (new species-rich native hedgerows, hedgerow enhancements, mixed scrub, additional trees, attenuation pond), and all other linear features are being retained on-site. However, without sufficient mitigation or implementation of a rigorous lighting strategy during the construction and operational phases of the development, light-averse species such as barbastelle, brown long-eared bat, and *Myotis* sp. are unlikely to use said habitats as a result of additional lighting associated with the residential development.

Artificial light at night (ALAN) is known to have detrimental impacts to bat activity (ILP, 2023). The lighting of key habitat features for bats would impair their ability to move around the landscape and forage within the Site boundary, thus reducing their ability to survive.

Therefore, a sensitive lighting strategy should be implemented following the guidelines set out in the ILP Guidance Note 08/23 (ILP, 2023) to ensure suitable roosting and foraging areas are retained for bats with maximum use of appropriate luminaries and directed lighting. It is recommended that an ecologist collaborates with a lighting engineer to ensure that the lighting plan is ecologically sensitive. Where not immediately adjacent to residential and commercial buildings, retained and enhanced bat habitat such as the hedgerows, as well as newly created habitat such as the pond and grassland, should remain in complete darkness. The ILP guidelines state that where 'complete darkness' on a feature or buffer is required, it may be appropriate to consider this to be where illuminance is at or below 0.2 lux on the horizontal plane, and at or below 0.4 lux on the vertical plane. This has been demonstrated to be a lux level at which activity of the most light-sensitive bats remain unaffected.

For retained or newly created habitats already affected by artificial lighting from off-site sources such as residential housing, it is recommended that there is no net increase in lux level. Figure 7 shows areas which must be at complete darkness and those where the light levels should not increase from their baseline levels.

Figure 7: Recommended dark areas and areas with no net lux increases



Recommendation 1

To ensure there is provision of alternative commuting and foraging habitat features for light-averse species to suitably compensate for the loss key commuting features, a sensitive lighting strategy must be implemented during both the construction and post-development phases. The strategy must take into account the habitat features highlighted in Figure 7 at the development's boundaries.

Opportunities for biodiversity enhancement

Pursuant to the NPPF (see Appendix 1), all planning decisions should aim to maintain and enhance, restore or add to biodiversity and geological conservation interests.

The provision of roosting opportunities for bats would enhance the area for these species. It is therefore recommended that bat boxes are incorporated within the design scheme, providing at least one bat box per five dwellings. At least three tree mounted boxes should also be incorporated into the design scheme to enhance the roosting opportunities for bats post development. The bat box scheme should be produced at the detailed planning stages with the input of an ecologist to ensure that boxes are placed in appropriate locations. No roosting provisions or potential access points should be directly lit.

Recommendation 2

Develop a bat box scheme at the detailed design and planning stage.

All existing linear features such as the species-rich native hedgerows and lines of trees should be enhanced where of lower condition (identified along the western and northern boundaries as well as for the remaining length of hedgerow bisecting the Site). This will involve improving the connectivity of these features through native planting; filling any gaps with species such as hazel *Coryllus avellana*, hawthorn *Crateaegus monogyna*, and blackthorn *Prunus spinosa*. In the case of the lines of trees, a continuous canopy should be targeted through native planting of favourable trees for bats such as oak *Quercus robur*, ash *Fraxinus excelsior*, and beech *Fagus sylvatica*. Undisturbed vegetative strips must be considered for all linear features.

Opportunities exist on-site to enhance the available foraging and commuting habitat through wildflower planting and enhancement of linear features. The grassland buffers and open spaces proposed should incorporate plants that encourage a diversity and abundance of invertebrates, such as (but not exclusive to) evening primrose *Oenothera biennis*, honeysuckle *Lonicera periclymenum*, field poppy *Papaver rhoeas*, mallow *Malva sylvestris*, and ox-eye daisy *Leucanthemum vulgare*.

Moderate levels of activity of soprano pipistrelle were recorded during the survey effort in August, and low levels of *Myotis* sp. (likely to be Daubenton's bat) and barbastelle also utilise the Site. These species are known to favour foraging above water. The proposed pond in the south-east corner of the Site should be sufficient in providing said ecological niche in tandem with recommendation 1 regarding ALAN.

Recommendation 3

The planting of native wildflowers within the proposed grassland buffers should be considered to encourage a greater diversity and abundance of prey on-site to increase bat foraging activity. The existing linear features in lower condition such as the lines of trees and species-rich native hedgerows should also be enhanced to improve connectivity across the Site.

Table 8 below summarises the recommendations made within this report, and specifies the stage of the development at which action is required. Colour coding of cells within the table is as follows:

Key:

	No action required for this species group at this stage
	Action required

Table 8: Summary of further work required

Constraint	Pre-planning action required?	Pre-construction action required?	Construction phase mitigation required?	Enhancements proposed?
Retain key habitats such as tree lines along the boundaries	✓			
Incorporate dark corridors along key foraging areas and commuting routes and develop sensitive lighting strategy		✓	✓	
Develop a bat box scheme		✓		
Install bat boxes			✓	✓

6. CONCLUSIONS

In March 2025, MKA Ecology Ltd were commissioned to undertake an assessment of the bat activity at Land East of Walnut Tree Road, Pirton by Blakeney Estates. Between May and October 2025 vantage point, transect, and automated static bat detector surveys were conducted to identify the bat species present, assess how they utilise the Site, and identify potential impacts of development.

A regionally significant species assemblage was recorded on-site with at least eight different species of bat. The majority of activity during all survey types was from common pipistrelle, with soprano pipistrelle at moderate levels. Light-averse species including barbastelle, *Myotis* sp., and brown long-eared bat were also identified as using the Site.

The lines of trees and species-rich hedgerows along the Site's boundaries as well as bisecting the Site have been identified as foraging and commuting areas. The preliminary plans propose to retain these features except for the bisecting hedgerow (which was used primarily by common pipistrelles). New species-rich hedgerow, trees, a pond, mixed scrub, and grassland are also being proposed as compensation, as well as enhancement of lower condition hedgerows and lines of trees.

A sensitive lighting strategy must be implemented for both the construction and operational phases of the proposed development following guidance from the Institute of Lighting Professionals Guidance Note 08/23 (ILP, 2023) to ensure alternative commuting and foraging habitat will be utilised by the light-averse species recorded on-site.

It is recommended that a bat box scheme is developed at the detailed planning stage and this should include integrated/wall mounted boxes on the proposed new buildings and in the trees across the Site.

7. REFERENCES

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8. APPENDICES

Appendix 1: Relevant wildlife legislation and planning policy

Please note that the following is not an exhaustive list, and is solely intended to cover the most relevant legislation pertaining to species commonly associated with development sites.

Subject	Legislation (England)	Relevant criminal offences
Bats (all species)	The Conservation of Habitats and Species Regulations 2017 All bat species are listed on Schedule 2, which designates them as European Protected Species. European Protected Species are subject to the provisions of Part 3, Regulation 41 (Protection of certain wild animals).	- Deliberate capture, injury or killing of a bat; - Deliberate disturbance of a bat; - Damage or destruction of a bat roost; - To possess, control, transport, sell or exchange, or to offer for sale or exchange, any live or dead bat or part of a bat, or anything derived from a bat or any part of a bat. Notes In this interpretation, a bat roost is “a <i>breeding site or resting place of a bat</i>”. Because bats tend to reuse the same roosts, bat roosts are considered to be protected whether or not the bats are present at the time. In this interpretation, disturbance of animals includes <i>in particular</i> any disturbance which is likely – (a) to impair their ability: - to survive, to breed or reproduce, or to rear or nurture their young, or - in the case of animals of a hibernating or migratory species, to hibernate or migrate; or

Subject	Legislation (England)	Relevant criminal offences
		(b) to affect significantly the local distribution or abundance of the species to which they belong.
	Wildlife and Countryside Act 1981 All bat species are listed on Schedule 5 and are therefore subject to parts of the provisions of Section 9 (Sections 9(4)(b) and (c) and Section 9(5)).	• Intentional or reckless disturbance of a bat while it is occupying a roost; • Intentional or reckless obstruction of access to a roost; • To sell, expose for sale, possess or transport for the purpose of sale, any live or dead bat or any part of, or anything derived from a bat; or • Publishing or causing to be published any advertisement likely to be understood as conveying that an individual buys or sells, or has an intention to buy or sell bats. In this interpretation, a bat roost is "any structure or place which any wild [bat]...uses for shelter or protection". Because bats tend to reuse the same roosts, bat roosts are considered to be protected whether or not the bats are present at the time.

The Wildlife & Countryside Act 1981

Full legislation text available at: <http://www.legislation.gov.uk/ukpga/1981/69>

Conservation of Habitats and Species Regulations 2017

Full legislation text available at: <http://www.legislation.gov.uk/uksi/2017/1012/contents/made>

Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006

Full legislation text available at: <http://www.legislation.gov.uk/ukpga/2006/16/contents>

Several bat species are listed as Species of Principal Importance for the purpose of conserving biodiversity under Section 41 of the NERC Act 2006.

The NERC Act 2006 places a legal obligation on public bodies, including those considering planning applications, to maintain, and where possible enhance, the conservation status of any Section 41 species found on a site. Species included on Section 41 were also included on the UK Biodiversity Action Plan (BAP) and remain an integral part of the Post-2010 Biodiversity Framework.

These species are:

- Barbastelle *Barbastella barbastellus*;
- Bechstein's bat *Myotis bechsteinii*;
- Brown long-eared bat *Plecotus auritus*;
- Greater horseshoe bat *Rhinolophus ferrumequinum*;
- Lesser horseshoe bat *Rhinolophus hipposideros*;
- Noctule *Nyctalus noctula*; and
- Soprano pipistrelle *Pipistrellus pygmaeus*.

National Planning Policy Framework (NPPF)

Full text is available at: <https://www.gov.uk/government/collections/revised-national-planning-policy-framework>

A revised NPPF was published on 12 December 2024 setting out the Government's planning policies for England and the process by which these should be applied. The policies within the NPPF are a material consideration in the planning process. The key principle of the NPPF is a presumption in favour of sustainable development, with sustainable development defined as a balance between economic, social and environmental needs.

Policies 174 to 188 of the NPPF address conserving and enhancing the natural environment, stating that the planning system should:

- Contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes;
- Recognise the wider benefits of ecosystem services; and
- Minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.

Furthermore, there is a focus on re-use of existing brownfield sites or sites of low environmental value as a priority, and discouraging development in National Parks, Sites of Specific Scientific Interest, the Broads or Areas of Outstanding Natural Beauty other than in exceptional circumstances.

Where possible, planning policies should also

“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”.

Appendix 2: Bat box recommendations

A wide range of bat boxes are available to suit a variety of species and design requirements. Bat boxes can be mounted on trees (dependent on box design).

Boxes are more likely to be inhabited if they are located where bats feed and it may help to place the box close to features such as tree lines or hedgerows, which bats are known to use for navigation and can provide immediate cover for bats leaving the roost. Boxes should be placed in areas sheltered from strong winds and are exposed to the sun for part of the day. Access to any bat roosting features should not be lit and should also be at a reasonable height to avoid predation (at least 2m if possible, preferably 4-5m).

Bat boxes for buildings

External

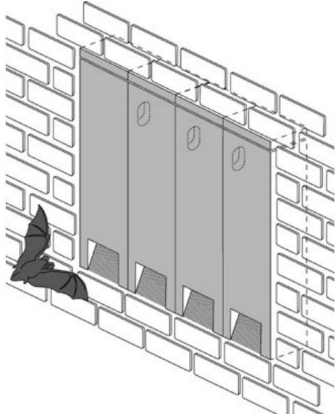
Example	Description	Picture
Beaumaris bat box	https://www.wildcare.co.uk/beaumaris-bat-box.html Dimensions: Small: (h) 40 x (w) 28 x (d) 6.5 cm, Large: (h) 50 x (w) 38 x (d) 6.5 cm Suitable for crevice dwelling bats, this bat box is made from 100% woodstone and is available in two sizes. These boxes have a rough interior to provide grip. They have good thermal insulation, reducing temperature fluctuations within the box. They are painted black to best absorb the sun's heat, which is important as bats need to increase their body temperature before they emerge in the evening.	
Schwegler 1WQ	www.schwegler-nature.com Dimensions: (h) 58 x (w) 38 x (d) 11.5 cm Weight: approx. 21 kg Installation: Attached to most types of external brick, timber or concrete walls at least 3.5m. This box typically attracts building-inhabiting bat species. It is weather-resistant and	

Example	Description	Picture
	designed for both winter hibernation and larger colonies in summer, including nursery roosts. The box has a double walled system which provides insulation and self-ventilation. The box has a variety of roosting features, making it suitable for different species, allowing individuals to find optimum conditions and it is self-cleaning.	
Schwegler 1FQ	www.schwegler-nature.com Dimensions: (h) 60 x (w) 35 x (d) 9 cm Weight: 15.8kg Installation: Attached to most external brick, timber or concrete walls at least 3m high. This box is ideal for all types of bats that inhabit buildings. The box is weather-resistant, provides varied roosting environments for each species requirements and is also temperature controlled and self-cleaning. The front panel of the box can also be painted during manufacture, to match an existing colour.	

Integrated

Example	Description	Picture
Ibstock brick enclosed bat boxes	https://ibstockbrick.co.uk/kevington/eco-products/ Dimensions: 215 x 215 or 215 x 290 (mm) These boxes are ideal for new-build homes and are designed specifically for pipistrelle bats. They come in a range of sizes brick types. They are self-cleaning, so require no maintenance.	

Example	Description	Picture
Habibat integrated bat boxes	http://www.habibat.co.uk/integrated-bat-boxes These integrated bat boxes are made of insulating concrete which provides an internal roost space, and can be integrated into the fabric of a building as it is built or renovated. They offer boxes in a range of sizes and styles, and can all be customised with a range of finishes. This includes, brick, block, stone, wood or a rendered finish, ensuring the box is unobtrusive and aesthetically pleasing	
Bird Brick House bat box	https://www.birdbrickhouses.co.uk/brick-nesting-boxes/bat-box/ These bat boxes can be supplied in brick fronted, half bond and quarter bond brickwork or alternatively with a stainless steel mesh fitted to the front. The mesh is designed for optimum adhesion in render and stonework applications. A basic version can be fitted directly behind weatherboarding or into studwork. These bat boxes are suitable for a range of bat species, the entrance hole and internal design can be tailored to suit different species of bat	
Built-in Woodstone bat box	https://www.nhbs.com/build-in-woodstone-bat-box Dimensions: (H) 500 x (W) 210 x (D) 160mm This bat box has been specifically designed to fit into the cavity of house walls, with the entrance sitting flush with the outside bricks. It is manufactured from WoodStone with removable side panels so that several boxes can be placed side by side. WoodStone is a mixture of sawdust from FSC wood sources and concrete, and it is designed to last for years. It is breathable and Woodstone maintains a consistent temperature	

Example	Description	Picture
	inside, providing excellent insulation for roosting bats.	
Schwegler 1FR and 2FR	www.schwegler-nature.com Dimensions: (h) 47 x (w) 20 x (d) 12.5 Weight: 9.8kg Installation: Can be installed on external walls – either flush or beneath a rendered surface in concrete and, during renovation work, under wooden panelling or in building cavities. Comes as single tube (1FR) or multiple tubes (2FR). This box is ideal for all types of bats that inhabit buildings and is designed as a summer roost. It provides a variety of roosting features and is designed to maintain climatic conditions. It is self-cleaning and weather-resistant.	 

Bat boxes for trees

Example	Description	Picture
Schwegler General Purpose Bat Box 2F	www.schwegler-nature.com Dimensions: 33 cm (height), 16cm (diameter) Weight: approx. 3.8 kg A general purpose box to hang on trees, suitable for all species. Made from durable woodcrete.	

Example	Description	Picture
Schwegler 2FN	www.schwegler-nature.com Height: 36 cm (height), 16cm (diameter) Weight: approx. 4.9 kg This box is suitable for woodland species such as Noctule <i>Nyctalus noctula</i>. The box has two entrances (front and back), is effective against predators, and is largely self-cleaning. It has a domed roof to allow bats to form clusters and excludes draughts and light.	
Schwegler 1FF	www.schwegler-nature.com Dimensions: (h) 43 x (w) 27 x (d) 14 cm Weight: 9.9 kg This box is suitable for crevice dwellers, such as Nathusius' Pipistrelle <i>Pipistrellus nathusii</i>, Daubenton's Bat <i>Myotis daubentonii</i> and Common Pipistrelle <i>Pipistrellus pipistrellus</i>. This box minimises temperature fluctuations in spring and autumn, provides roosting space for individual species climatic needs and is self-cleaning.	



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