



Bat Emergence Survey Report

Twemlow House, Nuneaton

Survey Date: August 2026

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0. Executive Summary

- 0.1 This report was commissioned by Mr and Mrs Tomassoni to assess the likelihood of the presence of bats and birds at the proposed redevelopment site located at Twemlow House, Bosworth Road, Nuneaton CV13 6DP (OS Grid Reference: SK 39166 00601). To complete this task, Eco 360 carried out a desktop study and a field survey.
- 0.2 The current proposals are for the demolition of the existing single-storey garage and attached single-storey structures located to the east of the main dwelling. These structures are to be replaced with a new two-storey pitched roof extension, extending to a height just below the eaves of the existing dwelling.
- 0.3 Due to the amount of potential ingress/egress points and suitable roosting features, the building was deemed as having **high** potential for bats to roost and **moderate** potential for birds to nest.

0.4 Summary

Bat presence/absence

From the survey visit undertaken on the site, it has been concluded that the structure contains no bat roosts. However, the occasional commuting bat is present within the local landscape.

Bird presence/absence

From the survey visit undertaken at the site, it can be concluded that the surveyed structures contain active bird nests, including four active house sparrow nests and one active blue tit nest. Furthermore, the surrounding landscape provides all of the necessary habitat elements that birds require, and their presence within the local landscape can be assumed.

Ecological value of building units

The ecological value of the buildings has been deemed as **negligible** to bats. The ecological value of the buildings to birds has been deemed high due to the confirmed presence of active nesting birds, including multiple house sparrow nests and an active blue tit nest within the surveyed structures.

0.5 Recommendations

The recommendations for the surveyed building can be summarised as follows (please refer to section '5 – Recommendations' for a more in-depth description):

- No compulsory recommendations in relation to bats are apparent.
- Optional: Install at least one Eco Bat Box to enhance the site for the local bat populations.
- Optional: Install a variety of bird boxes around the site post development to enhance the site for the local bird populations.

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1 Introduction

1.1 Report rationale

This report was commissioned by Mr and Mrs Tomassoni to assess the likelihood of the presence of bats and birds at the proposed redevelopment site located at Twemlow House, Bosworth Road, Nuneaton CV13 6DP (OS Grid Reference: SK 39166 00601). To complete this task, Eco 360 carried out a desktop study and a field survey. The field survey was completed by Mr Nathan O'Shea: BSc (Hons), Ecologist (Accredited Agent on a Natural England Bat License, details can be provided on request).

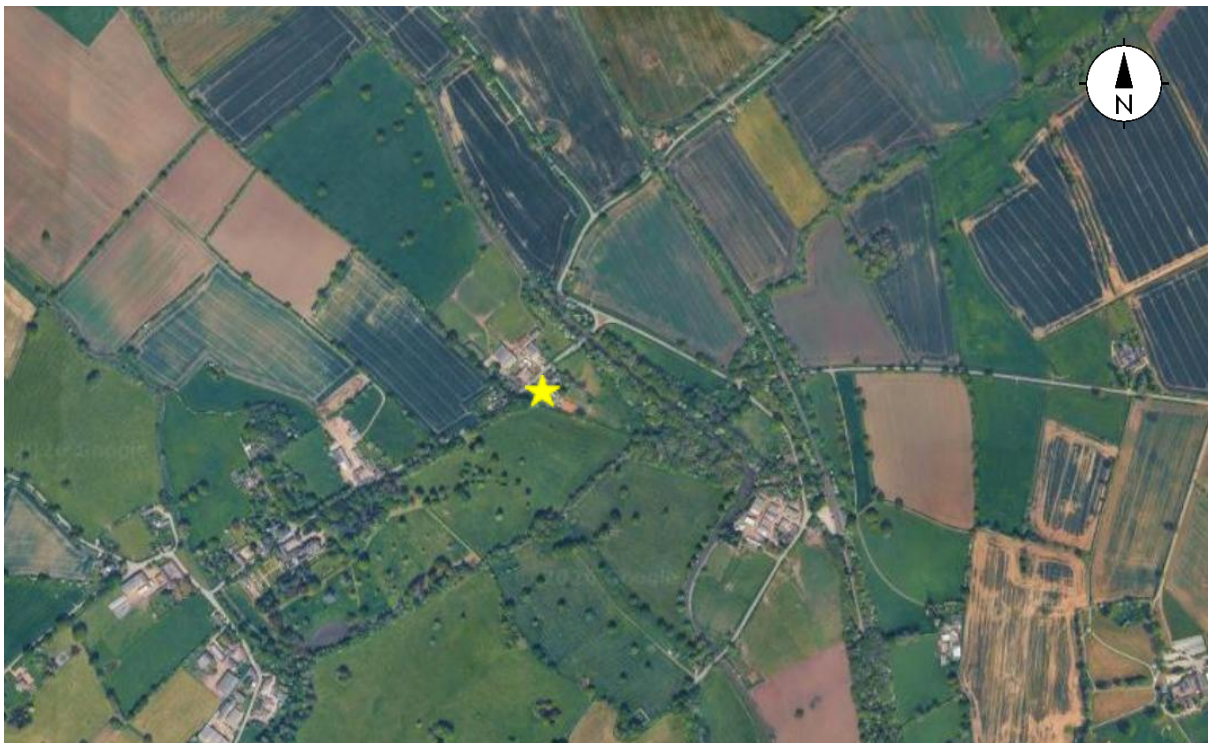
1.2 Site description

The site is situated within a semi-rural setting and comprises a detached residential dwelling with associated outbuildings and surrounding gardens. In the immediate surroundings of the surveyed buildings, there are residential dwellings, amenity grassland, scattered trees, hedgerows and hard standing ground. Within the wider landscape there are linear commuting features and habitats suitable for bats including mature trees, grassland and connected hedgerow networks. These habitats provide suitable foraging and commuting opportunities for local bat populations. Additionally, the surrounding habitats provide nesting and feeding opportunities for local bird species. Given its location and surrounding habitats, the site has the potential to support local bat and bird populations.

Figure 1: An aerial photograph of the surveyed site (as shown by the red outline).



Figure 2: An aerial photograph of the surveyed site (yellow star) and some of the nearby habitats



1.3 **Description of Proposed works**

The current proposals are for the demolition of the existing single-storey garage and attached single-storey structures located to the east of the main dwelling. These structures are to be replaced with a new two-storey pitched roof extension, extending to a height just below the eaves of the existing dwelling.

1.4 **Purpose of surveys**

The purpose of the surveys was to determine if any bats or birds were present at the site, and if so, to understand how they were using the building(s), vegetation, and surrounding area. The surveys were carried out following Bat Conservation Trust guidelines (4th edition).

1.4.1 This survey effort considered the potential for all **bat and bird species (including barn owls)** onsite:

- To establish the possibility of bat roosts and bird nests being present at the proposed development site.
- To assess any roost/nest status (i.e. what type and numbers of individuals).
- To assess suitable food, resources and habitat requirements on site and in the local landscape.

1.4.2 The proposed works at the site will be evaluated using the gathered information and current knowledge in order to determine if further survey efforts are necessary, assess the potential impacts of the proposed scheme, and determine if a Natural England Development Licence is required for the protection of any protected species on site. This is done in order to maintain a favourable conservation status for these species.

2 Legislation

2.1 Legislation

All species of bat are fully protected under The Conservation of Habitats and Species Regulations 2017 (as amended).

In addition to this, some species have additional protection by being listed on the UK Biodiversity Action Plan (UKBAP).

The legislation afforded to bats makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.

All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), which protects birds, nests, eggs and nestlings from harm. In addition to this, some rarer species, such as barn owls are afforded extra protection.

2.2 National Planning Policy Framework

The National Planning Policy Framework promotes sustainable development. The Framework specifies the need for protection of designated sites and priority habitats and species. An emphasis is also made on the need for ecological infrastructure through protection, restoration and re-creation. The protection and recovery of priority species (considered likely to be those listed as species of principal importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006) is also listed as a requirement of planning policy

In determining a planning application, planning authorities should aim to conserve and enhance biodiversity by ensuring that: designated sites are protected from harm; there is appropriate mitigation or compensation where significant harm cannot be avoided; measurable gains in biodiversity in and around developments are incorporated; and planning permission is refused for development resulting in the loss or deterioration of irreplaceable habitats including aged or veteran trees and also ancient woodland.

3 Survey Methodology

3.1 Desktop Survey Methodology

- 3.1.1 A variety of resources were independently consulted to assess the known local records within the nearby area and the importance of the site within the local landscape from an ecological perspective. The resources used were the Local Records Centre, , www.ordnancesurvey.co.uk, Google Maps, Google Earth and Bing Maps. A search of other relevant nature conservation information was made through the use of the Multi-Agency Geographic Information for the Countryside (MAGIC) database.
- 3.1.2 The local records centre was contacted to provide data on all bat and bird species within 2km of the proposed development site at this point.

3.2 Field Survey Methodology

3.2.1 Initial Site Survey

This is done by assessing the site by visually inspecting all building/s/structures and any trees/vegetation to be impacted by the proposed works. This is done to assess the resource availability for protected species on site and in the immediate area. Particular reference is made to:

- The presence or absence of bats and birds' onsite.
- Any evidence of potential bat roosts and birds' nests onsite.
- Whether any additional survey effort will be required.

During the initial survey, an internal and external inspection of the building(s) is undertaken to look for signs of bat activity. This is done in accordance with BCT guidelines for the assessment of building(s) and built structures.

3.2.2 External Inspection

This survey method is used to locate potential ingress and egress points around the structures that both bats and birds could use to gain access into the building. It also aims to identify any areas where cracks and crevices are present to be used as roosting/nesting features. This visual inspection is carried out in full daylight using binoculars, endoscope, torches and ladders.

This will allow for the determination of the following information:

- The type of building(s) surveyed.
- The approximate age of building(s) surveyed.
- The construction type and materials used.
- The presence of potential roost features (e.g. missing roof tiles, raised ridge tiles, air vents, cracks and crevices within the mortar).
- The presence of suitable ingress and egress points (e.g. missing windows and doors, missing mortar, lifted tiles).
- The location of any anecdotal evidence for the presence of protected species (e.g. nests, droppings or food remains).

3.2.3 Internal Inspection

This survey method aims to locate and examine areas which potentially provide suitable environmental conditions for bats. This visual inspection was undertaken by using binoculars, endoscope, torches, ladders and bat detectors to inspect internal features of the building(s).

This will allow for the determination of the following information:

- The presence of warm areas, dark areas, joints, crevices, beams and cavities that could be used for roosting and nesting purposes by bats and birds.
- To locate possible bat roost and bird nest sites.
- To listen for social calling bats.
- To locate any evidence of bat and bird presence through the identification of live or dead specimens, grease marks, droppings, food remnants, urine stains and/or the characteristic smell of bats.

3.2.4 Building/Vegetation Classification

A building/vegetation classification will be assigned to each surveyed feature that is proposed to be impacted by the scheme of works. This classification is based on the features potential to support roosting bats. The rating is also influenced by the location of the structure(s) in the local landscape, along with the number of suitable alternative roosting features, the type of features present in the landscape and the surveyor's experience. For example:

A structure that has a high level of anthropogenic disturbance with limited opportunities for access by bats, that is also situated within an urbanised area with few or no mature trees, parkland, woodland or wetland would generally equate to having negligible/low potential.

Conversely, an older structure (e.g. pre 20th century or early 20th century) with multiple features suitable for use by bats that is close to optimal foraging habitat would equate to having high potential.

The amount of additional survey effort required for each feature will depend on its rating:

- Negligible – No further survey effort is required
- Low – One further activity survey is required (structures only).
- Moderate – Two further activity surveys are required.
- High – Three further activity surveys are required.

3.2.5 Roost Categories

Any structures with evidence of bats will be further evaluated to assess which of the following roost categories may be present onsite:

➤ **Day Roost:**

A place where individual bats or small groups of males, rest or shelter during the daytime. These bats are rarely found at night at these sites.

➤ **Feeding Roost:**

A place where individual bats rest or feed during the night, but are rarely present in the day.

➤ **Hibernation Roost:**

A place where bats may be found either individually or together during the winter months. These roosts often have a constant cool temperature and high humidity.

➤ **Maternity Roost:**

A place where female bats give birth and raise their young to independence.

➤ **Mating Roost:**

A place where mating/copulation takes place between male and female bats. These can continue through the winter months.

➤ **Night Roost:**

A place where bats rest and/or shelter during the night, but will rarely be found here during the day. These can be used colonially or individually by the bats.

➤ **Satellite Roost:**

These are alternative roosting sites that are found within close proximity to the main nursery colony within the maternity roost. These are used throughout the breeding season by individual or small groups of female bats.

➤ **Swarming Site:**

A place where large numbers of bats come together during the latter summer months through until Autumn. These sites are classed as being important mating areas.

➤ **Transitional/Occasional Roost:**

A place that is used by individuals or small groups of bats for a small period of time. These are used by the bats prior to hibernation and/or shortly after hibernation.

3.2.6 Bat Detector Survey (presence/absence survey)

If required, the object for this survey method is to detect any bats leaving or returning to their roost sites within the surveyed features. This is achieved by undertaking dusk and dawn activity surveys under the following protocol:

- Commencing the survey 15 minutes before sunset (dusk survey) and 2 hours before sunrise (dawn survey).
- Listening for any social calls at potential roost sites using bat detectors.
- Standing at different survey points around the building(s) and/or vegetation using bat detectors to hear the bat echolocation.
- The survey will attempt to witness the first bats emerging (dusk) and the bats returning (dawn) to their roosts.
- Standing at different transect points at foraging/commuting areas around the site.
- Carrying out this survey methodology for up to two hours after sunset (dusk) and up to 15 minutes after sunrise (dawn). This will cover the emergence and re-entry of the bats at the potential roost site, for some bat species.

3.2.7 In order to comply with the required legislation, the results from the surveys will be collated to establish whether a European Protected Species (EPS) development licence will be required. If required, project appropriate species-specific compensation and mitigation measures will be devised to ensure the species remains at a favourable conservation status at the impacted site.

4 Results

4.1 Desktop Survey Results

The ecological data search revealed multiple bat and bird species within the 2km search radius of the structure(s).

4.1.1 Bats:

The ecological data search revealed several bat records within the 2km search radius. The UKBAP species recorded in the search were noctule (*Nyctalus noctula*) bats. The non-BAP species recorded in the search were common pipistrelle (*Pipistrellus pipistrellus*) bats. In addition to these, there were a few records of unidentified pipistrelle (*Pipistrellus* sp.) and unidentified bat (*Chiroptera*) specimens within the search radius.

4.1.2 Birds:

No bird data has been ordered by Eco 360 for this project. All UK birds can be split into three categories of conservation importance (red, amber and green – please see RSPB for more information). Eco 360 feels that this survey effort accurately represents the birds that may be present on the survey site.

4.1.3 Designated sites

As the current proposals remain within the site boundary, it was not necessary to obtain any further information regarding both Statutory and Non-Statutory Nature Conservation Designations. This is due to the proposed works not altering any of the landscape surrounding the site.

4.2 Field surveys

4.2.1 Site Surveys

Eco 360 were not made aware of any previous site surveys.

4.2.2 Roost Surveys

The structure was externally and internally inspected for the presence of bats and birds with the use of various types of equipment (including binoculars, torches, endoscope and ladders) in full daylight. Subsequent activity surveys use a variety of bat detectors that include Echometer Touch 2 Pro, Batbox Duet, Elekon Batscanner, SSF Bat2 and the EcoObs Batcorder. Additional, activity surveys use Night-Vision Aids (NVA) including Infrared Cameras. The Night-Vision Aids used include Bushnell Equinox Z2 Night Vision Monocular and Canon XA40 Camcorder paired with some additional infrared lighting.

4.2.3 Building survey

External Inspection

The surveyed site comprises a two-storey detached residential dwelling with associated single-storey garage and connected annexed structures. The structures proposed for demolition comprise a combination of flat roof sections with felt covering, corrugated sheet roofing and a single-storey pitched tiled roof section. The external elevations are predominantly brick built, with areas of cracked rendering and deteriorating mortar identified on the two-storey gable elevation where the proposed extension would connect to the existing dwelling.

Multiple Potential Roost Features (PRFs) were identified externally. Cracking and gaps within the cement render were noted along both ridge edges of the gable elevation, creating suitable crevice opportunities for roosting bats. These features extend vertically along the building and provide sheltered spaces with potential access into concealed voids. Due to the extent and condition of these features, and the inability to fully assess associated voids internally, the building was assessed as providing high bat roost potential, including potential suitability for maternity roosting bats.

Evidence of active bird nesting was also recorded externally. Four active house sparrow nests were identified within cracks and gaps associated with the gable elevation. In addition, an active blue tit nest was identified within the southern-most corner of the connected annex structure. Therefore, the structures provide high nesting potential and confirmed nesting activity for birds.

Internal Inspection

The loft space within the main dwelling was inspected where accessible. The internal roof void was observed to be largely unfinished, with missing wall membrane in places and substantial spider web accumulation throughout. Whilst no direct evidence of bats was observed during the survey, visibility into all sections of the roof void was restricted and some areas associated with external PRFs could not be adequately inspected from the interior. Consequently, it was not possible to fully determine whether these areas support roosting bats.

The single-storey tiled roof section contained predominantly timber boarding internally with one open section allowing limited inspection of roof void features. The internal structure provided additional crevices and sheltered voids that may support roosting bats.

Table 1: Bat Conservation Trust Good Practice Survey Guidelines.

Table 7.2. Recommended minimum number of survey visits for presence/absence surveys to give confidence in a negative result for structures (also recommended for trees but unlikely to give confidence in a negative result).		
Low roost suitability or PRF-I	Moderate roost suitability	High roost suitability or PRF-M
One survey visit. One dusk emergence survey ^a (structures). No further surveys required (trees).	Two separate dusk emergence survey visits ^b .	Three separate dusk emergence survey visits ^b .
a Structures that have been categorised as low potential can be problematic and the number of surveys required should be judged on a case-by-case basis (see para 5.2.44). In some cases, more than one survey may be needed, particularly where there are several buildings in this category. b Multiple survey visits should be spread out to sample as much of the recommended survey period (see Table 7.1) as possible; it is recommended that surveys are spaced at least three weeks apart, preferably more.		

4.2.4 DNA Results

No DNA Results were obtained for the site.

4.2.5 Emergence surveys

Emergence Survey 1: 16th June 2026

A dusk emergence survey was undertaken on 16th June 2026. The survey commenced at 21:18 and finished at 23:03, with sunset occurring at 21:33. Weather conditions were suitable for bat activity, with a temperature of 16°C throughout the survey.

Bat activity was first recorded at 21:49, when multiple common pipistrelle passes were observed. Further common pipistrelle passes were recorded regularly between 21:53 and 22:08, predominantly travelling east, with one individual recorded travelling north-east. A brown long-eared bat was recorded at 22:08 travelling south.

Additional activity included a whiskered bat heard but not seen at 22:06, common pipistrelle activity at 22:18 and 22:45. Further common pipistrelle activity was heard but not seen at approximately 22:55.

All recorded activity was considered to represent commuting and/or foraging activity within the surrounding habitat. No bats were observed emerging from the surveyed building.

Emergence Survey 2: 7th July 2026

A dusk emergence survey was undertaken on 7th July 2026. The survey commenced at 21:15 and finished at 23:00, with sunset occurring at approximately 21:29. Weather conditions were suitable for bat activity, with a starting temperature of 22°C, falling to 19°C.

Bat activity was first recorded at approximately 22:08, when a soprano pipistrelle pass was detected. A noctule was heard but not seen at approximately 22:13, followed by a common pipistrelle pass travelling south at 22:17. Common pipistrelle foraging activity was recorded at approximately 22:22.

Further activity comprised noctule activity heard but not seen at approximately 22:32, common pipistrelle activity heard but not seen at approximately 22:50, and unidentified bat activity heard but not seen at approximately 22:51.

All recorded activity was considered to represent commuting and/or foraging activity within the surrounding habitat. No bats were observed emerging from the surveyed building.

Emergence Survey 3: 28th July 2026

A dusk emergence survey was undertaken on 28th June 2026. The survey commenced at 20:49 and finished at 22:50, with sunset occurring at 21:04. The starting temperature was 23°C, falling to 19°C by the end of the survey.

Bat activity was first recorded at approximately 21:18, when common pipistrelle activity was heard but not seen. Common pipistrelle activity was subsequently recorded regularly throughout the survey, including passes to the north, north-east and south-west. At approximately 21:36, a common pipistrelle was observed circling the area for approximately four minutes.

Other species recorded included noctule activity heard but not seen at approximately 21:27, 21:49, 22:29 and 22:46 and brown long-eared bat activity heard but not seen at approximately 21:59 and 22:20. Further common pipistrelle activity included an individual circling for approximately two minutes at 22:01 and foraging/circling activity for approximately eight minutes from around 22:21.

Bat activity was relatively frequent during the survey and included both commuting and foraging behaviour. No bats were observed emerging from the surveyed building.

Figure 1: An aerial photograph of the surveyed buildings (red outline) and the surveyor/infrared camera locations (yellow stars).



Summary:

No evidence of bats using the surveyed structures as a roost was identified during the survey effort.

Surveyors Information

The survey was undertaken by bat ecologist/s and Eco 360 staff members:

Ms Carolanne Bishop BSc (Hons), Ecologist

Mr Yousafzai Aminullah BSc (Hons), Ecologist

Mr Noah Callan BSc (Hons), Ecologist

Mr Lewis Emery BSc (Hons), Ecologist

The following tables outlines the environmental variables from the survey visits:

Variable	Survey 1	Survey 2	Survey 3
Date	16/06/2026	07/07/2026	28/07/2026
Survey type	Dusk emergence	Dusk emergence	Dusk emergence
Time Start	21:18	21:15	20:49
Time Finish	23:03	23:00	22:50
Sunset Time	21:33	21:29	21:04
Temperature (start)	16°C	22°C	23°C
Temperature (end)	16°C	19°C	19°C
Cloud Cover (start)	Clear	Clear	Partly cloudy
Cloud Cover (end)	Clear	Clear	Partly cloudy
Humidity (start)	77%	62%	63%
Humidity (end)	83%	73%	75%
Wind (start)	13 km/h	8 km/h	8 km/h
Wind (end)	13 km/h	3 km/h	3 km/h
Precipitation (start)	10%	None	None
Precipitation (end)	20%	None	None

5 Impact Assessment

5.1 Survey Limitations

Due to inaccessible areas within the roof void, it was not possible to fully assess all potential roosting opportunities within the surveyed structures.

5.2 Potential Impacts of the re-development

5.2.1 Designated sites

As the proposed works are due to remain within the site boundary, the presence of any designated sites nearby is not applicable to this project. This, therefore, means that any building works would be of no detriment to the surrounding habitats and landscape.

5.2.2 Bat Roosts

The structure was not found to contain a bat roost. The proposed scheme of works will not alter the wider landscape and will not disturb foraging or commuting bats.

5.2.3 Bird Nests

Evidence of active bird nesting activity was identified during the survey, including four active house sparrow nests within the cracked render and gable features of the main dwelling, and one active blue tit nest within the southern-most corner of the connected annex structure. Therefore, the proposed scheme of works is anticipated to have a high impact on local bird populations if works are undertaken during the nesting season. Please see Section 6 for more details.

5.2.4 Foraging and commuting habitat

It is considered that the re-development of the site would have a **negligible** effect on potential foraging and commuting habitat. The site itself offers little foraging habitat, with the adjacent land containing better opportunities for bats and birds to use. Post development, all foraging and commuting habitats will be maintained, thus not negatively affecting the local landscape.

6 Recommendations

6.1 Bats

From the site survey, it has been established that the surveyed structures contain no bat roost.

Enhancement measures are also recommended as part of the development proposals. This may include the installation of Eco Bat Boxes, Integrated Eco Bat Boxes and/or Bat Access Tiles within the new structure. Any such features should avoid direct artificial lighting, and breathable roofing membranes should not be used immediately adjacent to bat access features.

6.2 Birds

From the site survey, it was established that active bird nests were present within the surveyed structures at the time of inspection. Evidence of active nesting included four active house sparrow nests associated with cracks and gaps within the gable elevation, alongside one active blue tit nest within the southern-most corner of the connected annex structure. Therefore, the proposed works are anticipated to have a high potential impact on nesting birds.

No demolition, roof works or vegetation clearance should be undertaken whilst nests remain active. Works should therefore be undertaken outside of the core bird nesting season (March to August inclusive) where practicable. Where works are required during this period, a precautionary check for active nests by a suitably qualified ecologist immediately prior to commencement is advised.

To enhance the site for nesting birds, a variety of bird boxes could be installed around the site to improve nesting opportunities within the local landscape. These should be targeted towards species likely to occur within the area and ideally provide opportunities for a range of species. Consideration should be given to the installation of sparrow terraces, open-fronted boxes and integrated nest features.

7 References

Bat Conservation Trust (2023). *Bat Surveys – Good Practice Guidelines*. 4th Edition. Bat Conservation Trust: London.

Berthinussen, A. & Altringham, J.D. (2012). The effect of a major road on bat diversity. *Journal of Applied Ecology* 49: p.p. 82–89.

Biodiversity Action Reporting System (2010). *Biodiversity Action in Staffordshire*. BARS. [Online]. Available at: http://ukbap-reporting.org.uk/plans/map_county.asp

BSBI (2008). *BSBI 2007 List*. [Online]. Available at: <http://www.bsbi.org.uk/html/database.html>.

The Conservation of Habitats and Species Regulations 2017 (Amendment). SI 2017/1012.

The Conservation (Natural Habitats, &c.) (Amendment) Regulations 2007. SI 2007/1843, London: HMSO.

Countryside and Rights of Way Act 2000 (c.37). London: HMSO.

Dietz, C., von Helversen, O. & Nill, D. (2009) *Bats of Britain, Europe and Northwest Africa*. London: A. C. Black

Hutson, A.M., Spitzenberger, F., Aulagnier, S., Coroiu, I., Karataş, A., Juste, J., Paunovic, M., Palmeirim, J. & Benda, P. (2008) *Pipistrellus pipistrellus*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.1

RSPB (2002). *The Population Status of Birds in the UK 2002-2007*

Rydell J & Racey, P A (1993). Street lamps and the feeding ecology of insectivorous bats. Recent Advances in Bat Biology, *Zool Soc Lond Symposium* abstracts.

UK Biodiversity Action Plan (2007). *UK List of Priority Species*. Joint Nature Conservation Committee. [Online]. Available at: <http://www.ukbap.org.uk/NewPriorityList.aspx>.

Wildlife and Countryside Act 1981 (and amendments) (c.69). London: HMSO.

8 Appendices

Appendix A: Site Plans

Appendix B: Artificial Light and Bats

Appendix C: Photographic Records

Appendix D: Night-Vision Aid (NVA) Screenshots

Appendix A: Site Plans



Appendix B: Artificial Lighting and Bats

Artificial lighting is known to affect bat's roosting and foraging behaviour, with lighting resulting in a range of impacts that includes roost desertion (BCT, 2009), delayed emergence of roosting bats (Downs et al., 2003), increased activity of some bat species and decreased activity by others (Stone et al., 2012).

An experimental approach using LED units, demonstrated that relatively fast-flying bat species, including the common pipistrelle, showed no significant impacts as a result of new artificial lighting, even when lighting was set at relatively high levels close to 50 lux.

In contrast, slow flying bats such as the myotis bats (*Myotis* spp.) showed sharp reductions in presence, even at low light levels of 3.6 lux (Stone et al., 2012).

Current recommendations for all bat species specifies that no bat roost should be directly illuminated.

Due to the impacts of lighting, mitigation and sensitive lighting design schemes are required for projects where bats are present. These should include bat friendly lighting plans that should aim to avoid lighting wherever possible. If this is not possible, then the minimisation of any lighting impacts is required by adopting the following measures:

➤ **To introduce lighting curfews or use of PIR sensors.**

Lighting curfews can be an effective way of avoiding impacts on bats. These curfews may involve either turning off lighting or dimming light units at specific times of the night, dimming units at key times of the year, providing the luminaire allows for this option via a control unit. Lighting to be triggered by PIR sensors can be expected to be illuminated only when required and for a low proportion of time.

➤ **To consider no lighting solutions where possible.**

Options such as white lining, good signage and LED cat's eyes should be considered as preferable. Reflective fittings may help make use of headlights to provide any necessary illumination in some areas.

➤ **To use only high pressure sodium or warm white LED lamps where possible.**

High pressure sodium and warm white LED lamps emit lower proportions of insect attracting UV light than mercury, metal halide lamps and white LED lighting. Generally, lamps should have a lower proportion of white or blue wavelengths, with a colour temperature <4200 kelvin recommended (BCT, 2014).

➤ **To minimise the spread of light.**

The light spread should be kept at or near horizontal to ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Baffles, hoods, louvres and shields should be used where necessary to reduce light spill.

➤ **To consider the height of the lighting column.**

While downward facing bollard lighting is often preferable, it should be noted that a lower mounting height does not automatically reduce impacts to bats as bollard lighting can often be designed to provide up-lighting. Where bollard lighting is considered to be the most appropriate system, bollard spacing or unit density should be kept to a minimum and units should be fitted with the appropriate hoods/deflectors to reduce any up-lighting.

➤ **To avoid reflective surfaces below lights.**

The polarisation of light by shiny surfaces attracts insects increasing bat activity (BCT, 2012). Consequently, surface materials around lighting require consideration.

Appendix C: Photographic Records



Photograph 1: Internal view of roof void.



Photograph 2: Internal view of roof void.



Photograph 3: View of garage section.



Photograph 4: External view of single-storey outbuilding.



Photograph 5: Internal roof structure with exposed timbers.



Photograph 6: Wall and roof junction.



Photograph 7: Internal roof structure.



Photograph 8: Close-up of brickwork.



Photograph 9: View of fascias on external elevation.



Photograph 10: View of fascias on external elevation.



Photograph 11: Photograph of detached brick outbuilding elevation.



Photograph 12: Rear elevation showing lean-to extension and roof covering.



Photograph 13: Main dwelling roof slope with tiles, skylights and eaves.



Photograph 14: Main dwelling roof and gable elevation.



Photograph 15: Main dwelling gable elevation.

Appendix D: Night-Vision Aid (NVA) Screenshots





9 Notice to Readers: Conditions of this Report

All reports are certified products and cannot be shown, copied or distributed to third parties without the written permission of Eco 360. No liability is accepted for the contents of the report, other than to that of the client(s). If any part of this report is altered without the written permission of Eco 360, then the whole report becomes invalid.

Eco 360 agrees to supply ecological consulting services and advice of a preliminary or thorough nature as advised or commissioned. Upon commissioning Eco 360 to undertake the work, the client(s) grant access to the site upon the agreed date. If no site access is available upon this date, Eco 360 holds the right to charge the client(s) for lost staffing time and additional travel costs.

Eco 360 undertake all site surveys with reasonable skill, care and diligence, within the terms of the contract that has been agreed with the client and abiding by the Eco 360 Terms and Conditions. The actions of the surveyors on site, and during the production of the report, were undertaken in accordance with the Code of Professional Conduct for the Chartered Institute of Ecology and Environmental Management.

The latest good practice guidelines put in place by Natural England or the relevant statutory conservation bodies have been followed by the surveyors on site. If those methodologies fail to identify a protected species during the survey efforts, no responsibility can be attributed to Eco 360. If any of these guidelines are adapted between the date(s) of the surveys being undertaken and the submission of this report, then Eco 360 takes no responsibility for this.

Should any equipment be damaged or lost on site at the fault of the client(s), then Eco 360 withholds the right to charge 100% above the current market value for that exact product or the nearest similar product.

The survey results purport the current status of the site and its potential for protected species utilisation at the time of surveying. It should not be viewed as a complete list of the possible flora and fauna species that could be using the site at different times of the year.

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No reliance should be made on any such comments in relation to the structural integrity of the features located on the surveyed site. All information within the report is based solely on evidence that has been found on site during the service provided. No individual opinion or inference will be made other than that of the suitably qualified ecologist appointed to the project.