



Elite Ecology

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Lane Ends Farm, Bradnop



Bat Activity Survey

September 2020



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Bat Activity Survey

Document Control**Document Properties**

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Title	Lane Ends Farm, Bradnop Bat Activity Survey

Version History

Date	Version	Status	Description/Changes
28/09/2020	V1	Draft	First Draft
29/09/2020	V1	Final Report	Proof Read

0. Executive Summary

- 0.1 This report has been prepared at the request of Mr. Rob Ford (Architect) on behalf of Mrs. Sarah Gould (Proprietor). It relates to the potential presence of bats and birds at the proposed re-development site located at Lane Ends Farm, Ashbourne Road, Bradnop, Staffordshire, ST13 7HA (Central OS Grid Reference: SK 02122 54039). To fulfill this brief, Elite Ecology undertook both a desktop study and a field survey.
- 0.2 The surveyed barn is to be converted for residential purposes.
- 0.3 Due to the amount of potential ingress/egress points and suitable roosting features and anecdotal evidence, the structure at Lane Ends Farm, Bradnop was deemed as having **moderate** potential for bats to roost and **low** potential for birds to nest. Therefore, a minimum of two further activity surveys are required during the bat survey season (May to September, inclusive). These were subsequently undertaken in August and September 2020.

0.4 Summary

Bat presence/absence

From the survey visit undertaken on the site, it has been concluded that the structures are not currently in use by roosting bats. However, it has been concluded that both brown long-eared (*Plecotus auritus*) and common pipistrelle (*Pipistrellus pipistrellus*) bats are roosting within the local landscape

Bird presence/absence

From the survey visit undertaken on the site, it can be concluded that the surveyed structure contains no evidence of nesting birds from either the current or previous seasons. The surrounding landscape also provides all of the necessary habitat elements that birds require, and their presence can be assumed.

Ecological value of building units

The ecological value of the buildings has been deemed as **low** to bats due to no current bat roosts being present, but two very old bat droppings identified. The ecological value of the buildings to birds has been deemed **negligible** due to no evidence of bird presence in relation to the building.

0.5 Recommendations

The recommendations for Lane Ends Farm, Bradnop can be summarised as follows (please refer to section '5 – Recommendations' for a more in-depth description):

- Works should proceed using the methods in section 5.1.
- Install two [Eco Bat Boxes](#) at the completion of the works. One should be placed on the eastern elevation and one on the southern.
- Optional Enhancement: Install a variety of [bird boxes](#).

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1 Introduction

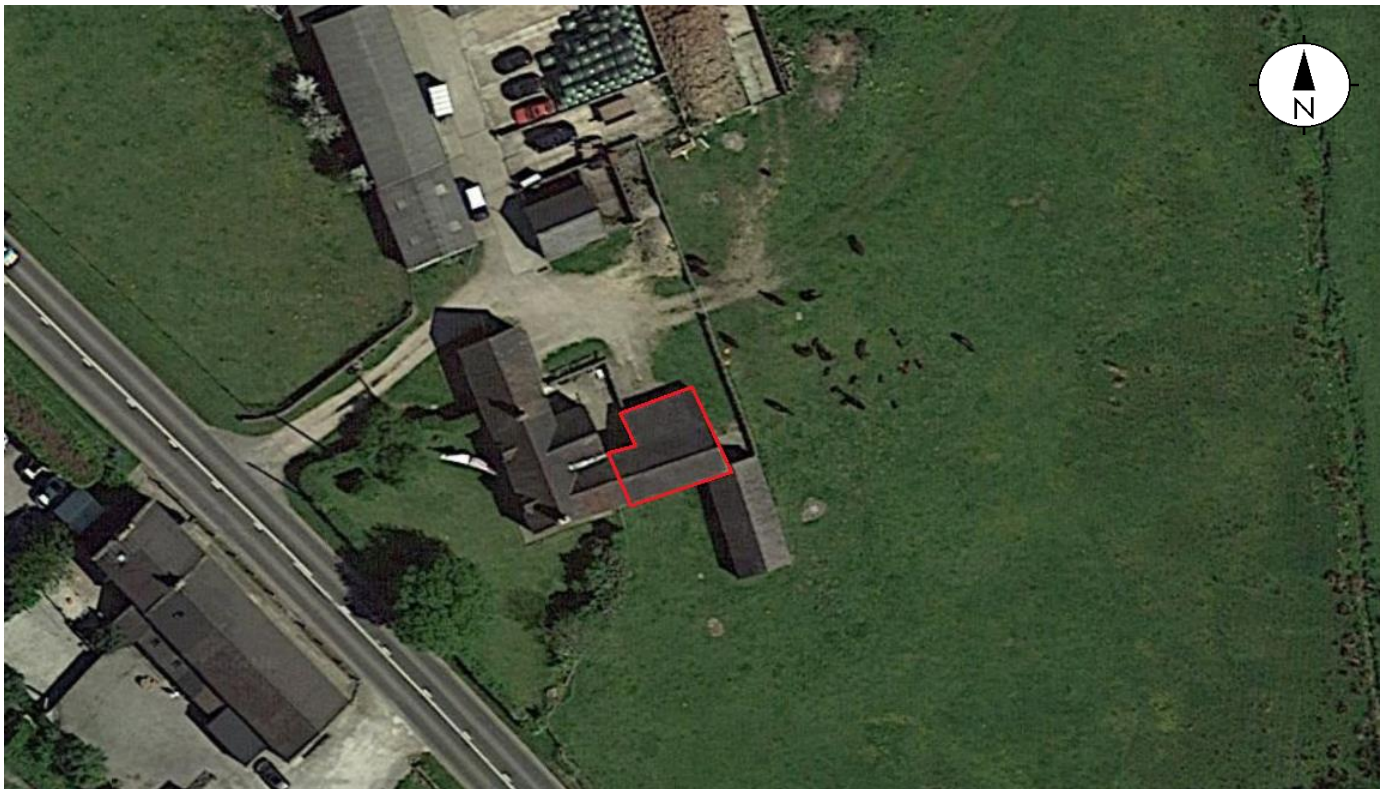
1.1 Report rationale

This report has been prepared at the request of Mr. Rob Ford (Architect) on behalf of Mrs. Sarah Gould (Proprietor). It relates to the potential presence of bats and birds at the proposed re-development site located at Lane Ends Farm, Ashbourne Road, Bradnop, Staffordshire, ST13 7HA (Central OS Grid Reference: SK 02122 54039). To fulfill this brief, Elite Ecology undertook both a desktop study and a field survey.

1.2 Site description

The site is situated within a rural setting, approximately 1.5km from the village of Bradnop. The surveyed barn measures approximately 87m². Surrounding the structure is hard standing ground, drystone walls, agricultural structures, a farmhouse, a main road, scattered trees and grassland (both amenity in the front garden and improved pasture for grazing livestock). The habitats on site considered to contain potential to support the local bat and bird populations by offering roosting/nesting, commuting and foraging opportunities.

Figure 1: An aerial photograph of the surveyed structure at Lane Ends Farm, Bradnop (as shown by the red outline).



1.3 **Proposed works**

The surveyed barn is to be converted for residential purposes.

1.4 **Aims of surveys**

The aims of the surveys were to undertake an assessment of the building(s), vegetation and surrounding area to establish whether any bats and birds may be present and, if so, in what way they are using the site. The actions of the surveyors on the site and during the production of this report were conducted in accordance with Bat Conservation Trust (BCT) guidelines (3rd 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 information will subsequently be used in conjunction with the knowledge of the proposed works at the site to determine the potential need for further survey effort, the impacts of the proposed scheme of works, to establish whether a Natural England Development Licence is required along with species-specific mitigation and compensation. This is done in order to keep any protected species at a favourable conservation status on site.

2 Survey Methodology

2.1 Desktop Survey Methodology

- 2.1.1 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.naturalengland.org.uk, 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.
- 2.1.2 The local records centre was contacted to provide data on all protected bat and bird species within 2km of the proposed development site at this point. RECORD - Biodiversity Information Centre for Cheshire, Halton, Warrington & Wirral. (RECORD) were the relevant local records centre for this project.

2.2 Field Survey Methodology

2.2.1 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.

2.2.2 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).

2.2.3 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.

2.2.4 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.

2.2.5 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.

2.2.6 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.

- 2.2.7 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.

2.3 Surveyors Information

- 2.3.1 The survey was undertaken by licensed bat ecologist/s and members of the Chartered Institute of Ecology & Environmental Management (CIEEM) and Elite Ecology staff members:

Mr. Richard Millington: BSc (Hons), ACIEEM, Senior Ecologist, Natural England Bats Survey Licence Number: 2016-26861-CLS-CLS Bats Survey Level 2.

Miss. Bethan Knott: Assistant Ecologist.

Mr. Nicholas Hawkins: Assistant Ecologist.

2.4 Field Surveys

2.4.1 Site Surveys

Elite Ecology were made aware of a previous application of the site.

2.4.2 Roost Surveys

The building at Lane Ends Farm, Bradnop 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 Bat Box Duet, SSF Bat2 and the EcoObs Batcorder. The following table outlines the environmental variables from the survey visits:

Bat Activity Survey

Environmental variables	PRA and Activity Survey of the Building – 31 st August 2020. Dusk	Activity Survey of the Building –14 th September 2020. Dawn
Temp Start:	9.2°C	11.0°C
Temp Finish:	8.2°C	10.6°C
Humidity Start:	47.8%	80%
Humidity Finish:	46.8%	82%
Cloud Cover Start:	10%	10%
Cloud Cover Finish:	5%	30%
Wind Speed Average:	0.2 mph	1mph
Precipitation:	None	None

3 Results

3.1 Desktop Survey Results

3.1.1 Bats

The ecological data search revealed 68 bat records within the 2km search radius. The UKBAP species recorded in the search were brown long-eared (*Plecotus auritus*), noctule (*Nyctalus noctula*) and soprano pipistrelle (*Pipistrellus pygmaeus*) bats. The non-BAP species recorded in the search were Brandt's (*Myotis brandtii*), common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's (*Myotis daubentonii*) and whiskered/Brandt's (*Myotis mystacinus/brandtii*) bats. Finally, a few records of unidentified long-eared (*Plecotus* sp.) and unidentified pipistrelle (*Pipistrellus* sp.) specimens were revealed.

The nearest record to the survey site was of an unidentified pipistrelle bat located approximately 227m from the survey site.

3.1.2 Birds

Numerous protected and rare bird species were revealed within the 2km search radius. All UK birds can be split into three categories of conservation importance (red, amber and green – please see [RSPB](#) for more information).

The nearest records to the survey site are of barn owl (*Tyto alba*) witnessed approximately 114m away.

3.1.3 Designated sites

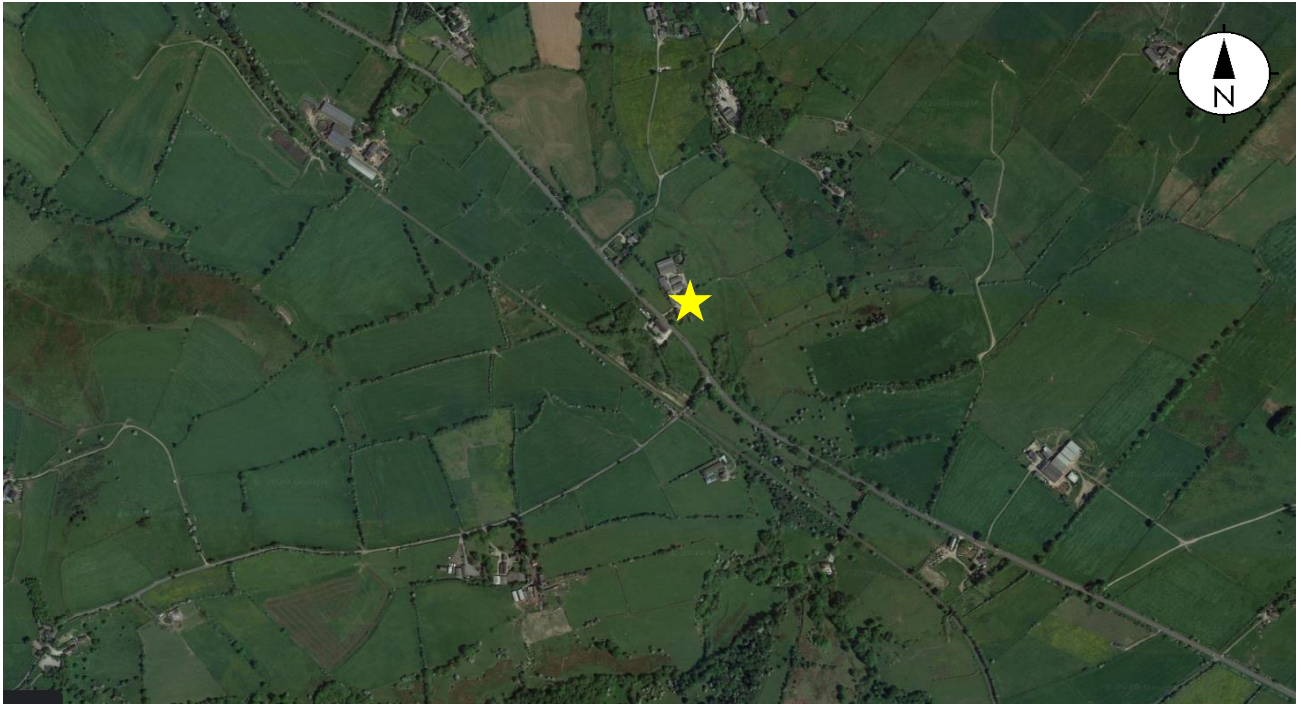
As the current proposals remain within the site boundary, it was not necessary to obtain any further information regarding both Statutory and Non-Statutory Nature Conservation Designations. This is due to the proposed works not altering any of the landscape surrounding the site.

3.2 Field surveys

3.2.1 Habitat description

The site itself contains habitats in the form of hard standing ground, buildings, amenity grassland and scattered trees. Within the wider landscape, further habitats are present. These come in the form of additional structures (and their associated gardens/yards), scattered trees, woodland, hard standing ground, pastureland and waterbodies. The habitats that surround the site have the potential to be utilized by a variety of protected species. Therefore, the habitats that are present in and around the site contains all of the elements that are considered to be critical in both bat and bird life cycles.

Figure 2: An aerial photograph of the surveyed site (yellow star) and some of the nearby habitats to the structures at Lane Ends Farm, Bradnop.



3.2.2 Building survey

The survey site contains seven barns.

External Inspection:

The surveyed structure is a small stone build barn, with a pitched clay tile roof. A number of gaps are present within the stonework to facilitate bat roosting or bird nesting. A lot of the gaps within the stonework were cobwebbed over. In addition to this, a number of gaps underneath the tiles can be seen, along with gaps underneath the ridge tiles and ridge vents. All of these features could facilitate bat and bird access into the structure. It is worth noting, however, that the windows and doors around the structure are in good condition, with no visible gaps for protected species entrance.

Internal Inspection:

Internally, the barn was found to have timber beams supporting the roof structure, with bitumen felt underlay. The felt is torn in places and is in very poor condition. The former barn was found to contain a small number of small tortoiseshell (*Aglais urticae*) butterfly wings, along with two very old droppings. These droppings were beginning to disintegrate, although one was salvaged and sent for DNA testing (please see section 3.2.4). Cobwebs are present throughout and a lot of natural daylight entered in sections. The walls, similarly to the exterior, had cracks and crevices for roosting and nesting potential. No bird nests were witnessed during the inspection.

3.2.3 Summary of the building inspection

Due to the amount of potential ingress/egress points and suitable roosting features and anecdotal evidence, the structure at Lane Ends Farm, Bradnop was deemed as having **moderate** potential for bats to roost and **low** potential for birds to nest.

Therefore, a minimum of two further activity surveys are required during the bat survey season (May to September, inclusive).

Table 1: Low/Moderate/High potential building(s) survey recommendations. The full guidance can be found in the Bat Conservation Trust Good Practice Survey Guidelines. These guidelines are what all local authorities abide by.

Bat Conservation Trust

Table 7.3 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	Moderate roost suitability	High roost suitability
One survey visit. One dusk emergence or dawn re-entry survey ^a (structures). No further surveys required (trees).	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey. ^b	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn. ^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 Section 5.2.9). If there is a possibility that quiet calling, late-emerging species are present then a dawn survey may be more appropriate, providing weather conditions are suitable. 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 two weeks apart, preferably more. A dawn survey immediately after a dusk one is considered only one visit.

3.2.4 DNA Results

One of the two droppings were collected and sent for DNA Analysis at EcoWarwicker, based at the University of Warwick. The results from this assessment revealed that a species could not be identified from the dropping. This could be from a number of reasons, but in this instance is thought to be due to the age of the dropping.

3.2.4 Activity surveys

Activity Survey 1 (31st August 2020):

This survey was undertaken at dusk, with sunset recorded at 19:58. During this survey, no bats were seen to emerge from the stone barn. Additionally, pre-emergent flight checks were regularly undertaken, with no specimens witnessed. However, brown long-eared (*Plecotus auritus*) and common pipistrelle (*Pipistrellus pipistrellus*) bats were witnessed foraging and commuting during this survey effort, with detection times indicating a roost in a nearby structure.

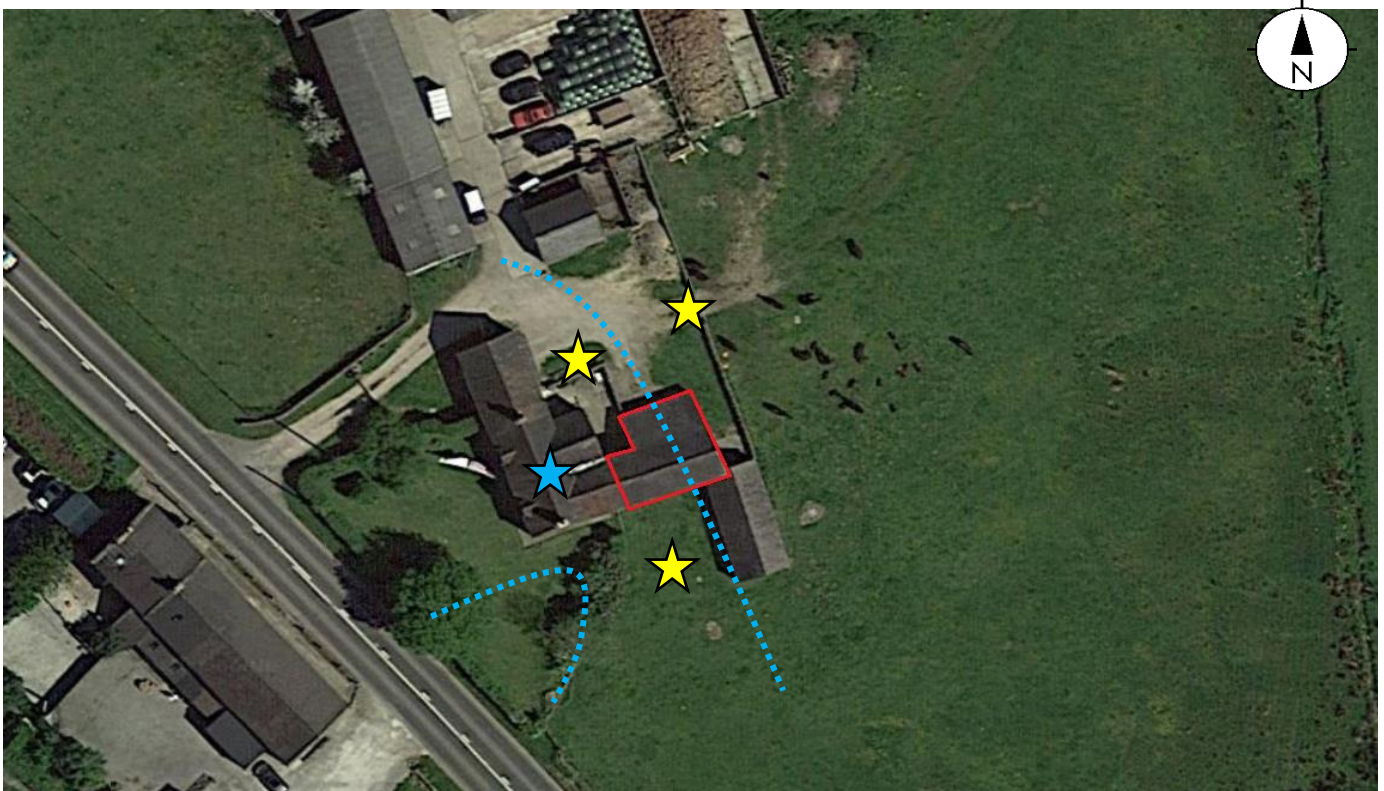
Activity Survey 2 (19th of August 2020):

This survey was undertaken at dawn, with sunrise recorded at 06:40. During this survey, no bats were seen to enter the stone barn to roost. However, one common pipistrelle (*Pipistrellus pipistrellus*) bat was witnessed entering the farmhouse underneath a ridge tile to roost.

Summary:

In summary, it can be concluded that the structure proposed for the works contains no current bat roost. However, it can be deduced from the survey effort, that brown long-eared (*Plecotus auritus*) and common pipistrelle (*Pipistrellus pipistrellus*) bats are roosting nearby, with one common pipistrelle bat day roost identified within the adjacent barn (please see figure 3).

Figure 3: An aerial photograph of the surveyed site (red line boundary), the surveyor locations (yellow stars) and the identified bat flight paths (blue lines). The blue star illustrates the ingress/egress points in use by the common pipistrelle (*Pipistrellus pipistrellus*) bat using the buildings.



4 Impact Assessment

4.1 Constraints

Constraints on:	Survey Information	Equipment Used
Constraint (Yes or No):	No	No
Explanation of Constraints:	N/A	N/A
Action Taken:	N/A	N/A

4.2 Potential Impacts of the re-development

The current planning proposal will see the structure converted for residential purposes. This will lead to disturbance and alterations for the current species that occupy the structure.

4.2.1 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.

4.2.2 Bat Roosts

Impact	Short-term Impacts: Disturbance	Long-term Impacts: Roost Modification	Long-term Impacts: Roost Loss
Classification:	Low	Low	Low
Justification:	No current bat roosts are present in the barn, although very old bat droppings (x2) were identified.	No current bat roosts are present in the barn, although very old bat droppings (x2) were identified.	No current bat roosts are present in the barn, although very old bat droppings (x2) were identified.
Any further action:	Further precautionary measures are required. Please see Section 5 Recommendations for more details.	Further precautionary measures are required. Please see Section 5 Recommendations for more details.	Further precautionary measures are required. Please see Section 5 Recommendations for more details.

4.2.3 Bird Nests

As no evidence of nesting birds were identified in or upon any of the structures that are proposed to be re-developed, the proposed scheme of works will be of a **negligible** effect to the local bird populations.

4.2.4 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.

5 Recommendations

5.1 Bats

From the site surveys, it has been established that the barn at Lane Ends Farm contains no current bat roosts. However, as two very old bat droppings were found, the following protocols should be followed:

5.1.1 Timings of the Works

Works on the structure should only take place in conditions that are deemed suitable for bat activity (temperature above 7°C and avoiding heavy rain). This will reduce any impacts on bats should they be found during the work.

5.1.2 Avoidance Measures

At the start of the proposed works, a licenced bat ecologist is required to be on site to conduct a toolbox talk prior to works commencing. On the morning prior to the commencement of the works, one [2F Schwegler Bat Box](#) is required to be installed on a nearby tree facing north for emergency purposes.

The building will then be thoroughly inspected by a licenced bat ecologist (both externally and internally), including through the use of an endoscope to check for any anecdotal presence of bats. This will check all cracks/crevices around the affected areas.

If bats or evidence of bats are found during the site visit, works must cease and a European Protected Species Mitigation Licence will be required from Natural England.

If any bats are harmed or injured during the works, the local bat group will be contacted.

5.1.3 Enhancements

For the proposed scheme of works, two [Eco Bat Boxes](#) are installed on the redeveloped structure. This should be placed on the eastern and southern elevations. These boxes should be placed high up on these elevations, either at the gable end or just below the fascia/roofline. These features should avoid any artificial lighting.

5.2 Birds

From the site survey, it has been established that there are no bird nests present within the surveyed structure.

To enhance the site for nesting birds, a variety of [bird boxes](#) could be installed around the site to enhance the nesting opportunities for a variety of species within the local landscape.

6 Summary

6.1 Bat presence/absence

From the survey visit undertaken on the site, it has been concluded that the structures are not currently in use by roosting bats. However, it has been concluded that both brown long-eared (*Plecotus auritus*) and common pipistrelle (*Pipistrellus pipistrellus*) bats are roosting within the local landscape.

6.2 Bird presence/absence

From the survey visit undertaken on the site, it can be concluded that the surveyed structure contains no evidence of nesting birds from either the current or previous seasons. The surrounding landscape also provides all of the necessary habitat elements that birds require, and their presence can be assumed.

6.3 Ecological value of building units

The ecological value of the buildings has been deemed as **low** to bats due to no current bat roosts being present, but two very old bat droppings identified.

The ecological value of the buildings to birds has been deemed **negligible** due to no evidence of bird presence in relation to the building.

6.4 Recommendations

The recommendations for Lane Ends Farm, Bradnop can be summarised as follows (please refer to section '5 – Recommendations' for a more in-depth description):

- Works should proceed using the methods in section 5.1.
- Install two [Eco Bat Boxes](#) at the completion of the works. One should be placed on the eastern elevation and one on the southern.
- Optional Enhancement: Install a variety of [bird boxes](#).

7 References

Bat Conservation Trust (2016). *Bat Surveys – Good Practice Guidelines*. 3rd 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

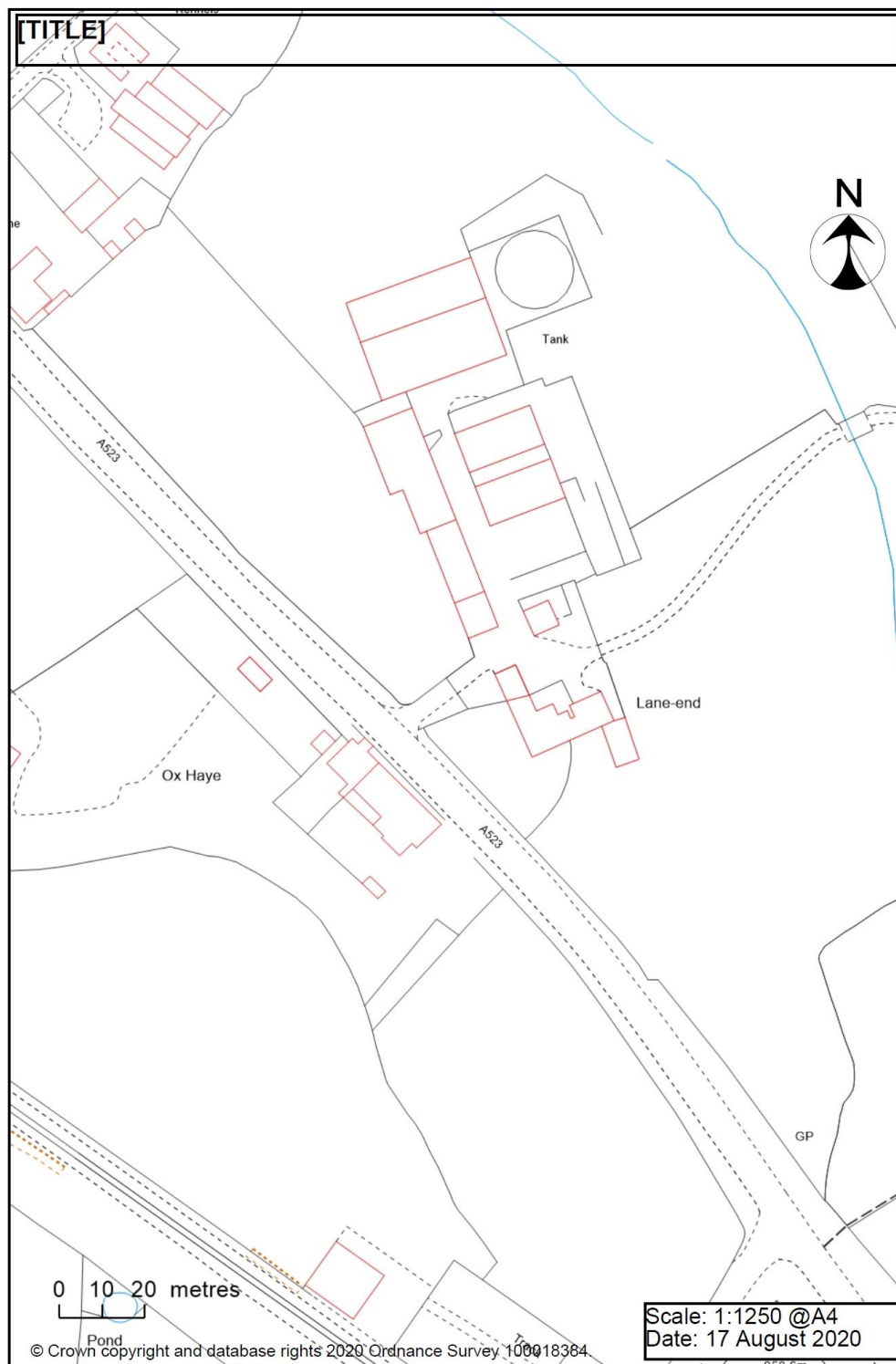
Appendix B: Eco Data Maps and Tables

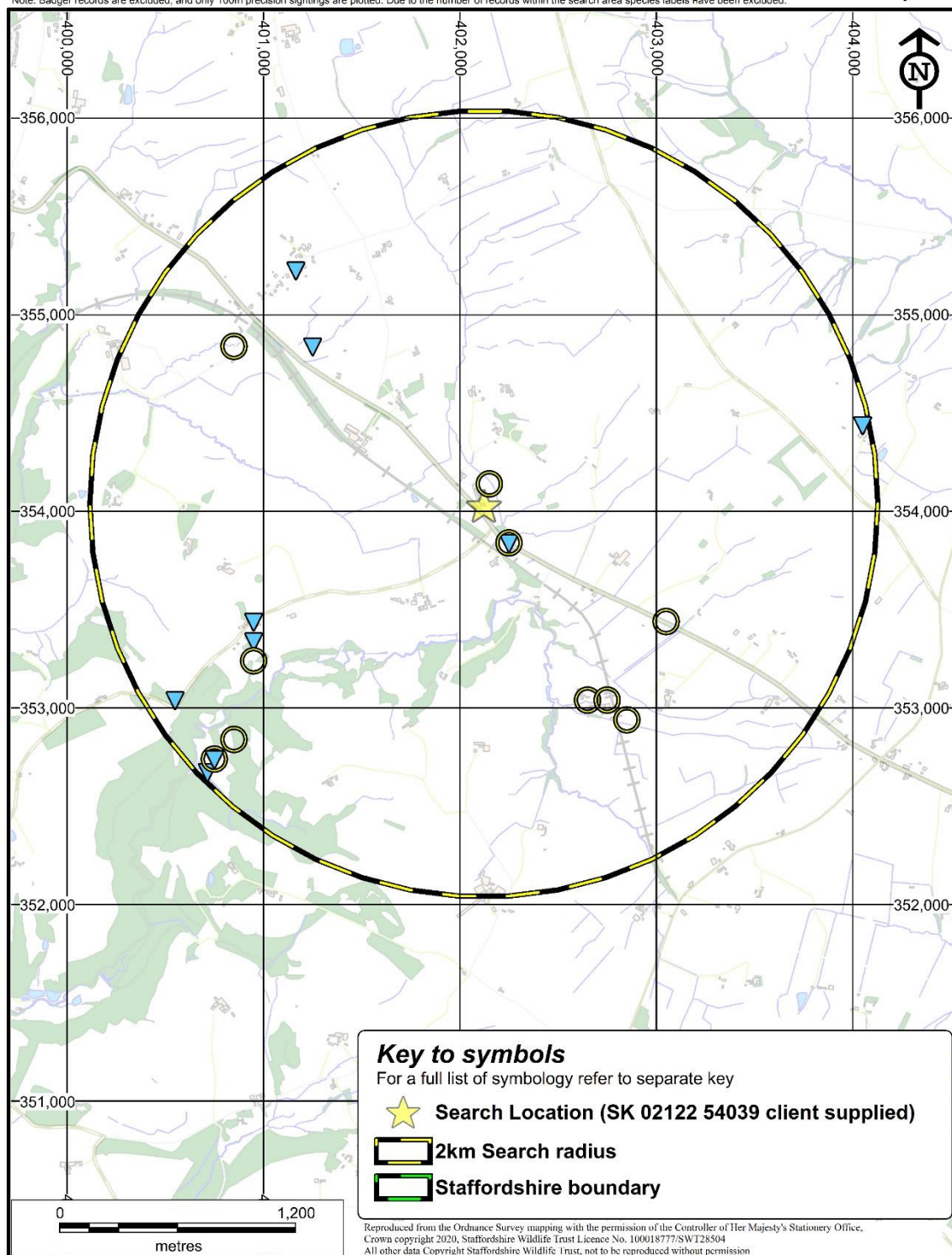
Appendix C: Artificial Light and Bats

Appendix D: Photographic Records

Appendix E: The Annual Bat Year (BCT)

Appendix F: Legislation

Appendix A: Site Plans

Appendix B: The Ecological Data Search Maps and Tables**Staffordshire Ecological Record**The Wolseley Centre, Wolseley Bridge, Stafford, ST17 0WT Tel: 01889 880100 Fax: 01880 880101
Email: info@staffs-ecology.org.uk**SER/20/308****Protected Bat & Bird Species****within 2km of Lane Ends Farm, Ashbourne Road (SK 02122 54039)**Note: Badger records are excluded, and only 100m precision sightings are plotted. Due to the number of records within the search area species labels have been excluded.

Bat Activity Survey

Bats:

Common Name	Latin Name
Brown Long Eared	<i>Plecotus auritus</i>
Common Pipistrelle	<i>Pipistrellus Pipistrellus</i>
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>
Noctule	<i>Nyctalus noctula</i>
Whiskered/Brandt's	<i>Myotis mystacinus/brandtii</i>

Birds:

Common Name	Latin Name
Barn Owl	<i>Tyto Alba</i>
Black Headed Gull	<i>Chrococephalus ridibundus</i>
Black Stork	<i>Ciconia nigra</i>
Brambling	<i>Fringilla montifringilla</i>
Bullfinch	<i>Pyrrhula pyr</i>
Common Crossbill	<i>Loxia curvirostra</i>
Cuckoo	<i>Culculus canorus</i>
Curlew	<i>Mumenius arquata</i>
Dipper	<i>Cinclus cinclus</i>
Dunnock	<i>Prunella modularis</i>
Fieldfare	<i>Turdus pilaris</i>
Grasshopper Warbler	<i>Locustella naevia</i>
Great Black Back Gull	<i>Larus marinus</i>
Green Sandpiper	<i>Tringa ochripus</i>
Grey Partridge	<i>Perdix perdix</i>
Grey Wagtail	<i>Motacilla cinerea</i>
Golden Plover	<i>Pluvis apricaria</i>
Goshawk	<i>Accipter gentillis</i>
Hawfinch	<i>Cocthraustes cocthraustes</i>
Hen Harrier	<i>Cirucs cyaneus</i>
Herring Gull	<i>Larus argenentatus</i>
Hobby	<i>Falco subbuteo</i>
House Martin	<i>Delichon urbicum</i>
House Sparrow	<i>Passer domesticus</i>
Kestrel	<i>Falco tinnunculus</i>
Kingfisher	<i>Alcedo atthis</i>
Lapwing	<i>Vahellus van</i>
Lesser Black Back Gull	<i>Larus fuscus</i>
Lesser Red Poll	<i>Acanthis cabaret</i>
Lesser Spotted Wood Pecker	<i>Dendrocopos minor</i>
Linnet	<i>Linaria cannabina</i>
Marsh Tit	<i>Poecile palustris</i>
Mallard	<i>Anas platyrhynchos</i>
Merlin	<i>Falco columbarius</i>
Mistle Thrush	<i>Turdus viscivorus</i>
Osprey	<i>Pandelion haliaetus</i>
Oyster Catcher	<i>Haematopus ostralegus</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Pied Flycatcher	<i>Ficedula hypolaeuca</i>
Pink footed Goose	<i>Anser brachyrhynchus</i>
Red Start	<i>Phoenicurus phoenicurus</i>
Red Kite	<i>Milvus milvus</i>
Red Wing	<i>Turdus iliacus</i>
Reed Bunting	<i>Emberzia citrinella</i>
Shelduck	<i>Tadorna tadorna</i>

Bat Activity Survey

Short Eared Owl	<i>Asio flammeus</i>
Skylark	<i>Alauda arvensis</i>
Spotted Flycatcher	<i>Muscicapa striata</i>
Snipe	<i>Gallinago hypoleuca</i>
Song Thrush	<i>Turdus philomelos</i>
Stock Dove	<i>Columba oenas</i>
Starling	<i>Sturnus vulgaris</i>
Swift	<i>Apus apus</i>
Tawny Owl	<i>Strix aluco</i>
Teal	<i>Anas creca</i>
Tree Pipit	<i>Anthus trivialis</i>
Tree Sparrow	<i>Passer montanus</i>
Whin chat	<i>Saxicola rubetra</i>
Whooper Swan	<i>Cygnus cuneros</i>
Wigeon	<i>Anas penelope</i>
Willow Tit	<i>Poecile montanus</i>
Willow Warbler	<i>Phylloscopus sibilatrix</i>
Woodcock	<i>Scolopax rusticola</i>
Wood Warbler	<i>Phylloscopus sibilatrix</i>

Appendix C: 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 cats 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 D: Photographic Records**Plate 1:** A photograph of the surveyed barn.**Plate 2:** An image showing the missing and lifted tiles on the roof of the barn.

Plate 3: A photograph showing the missing mortar between the tiles and the stone work.



Plate 3: A photograph showing the missing mortar between the stone work.

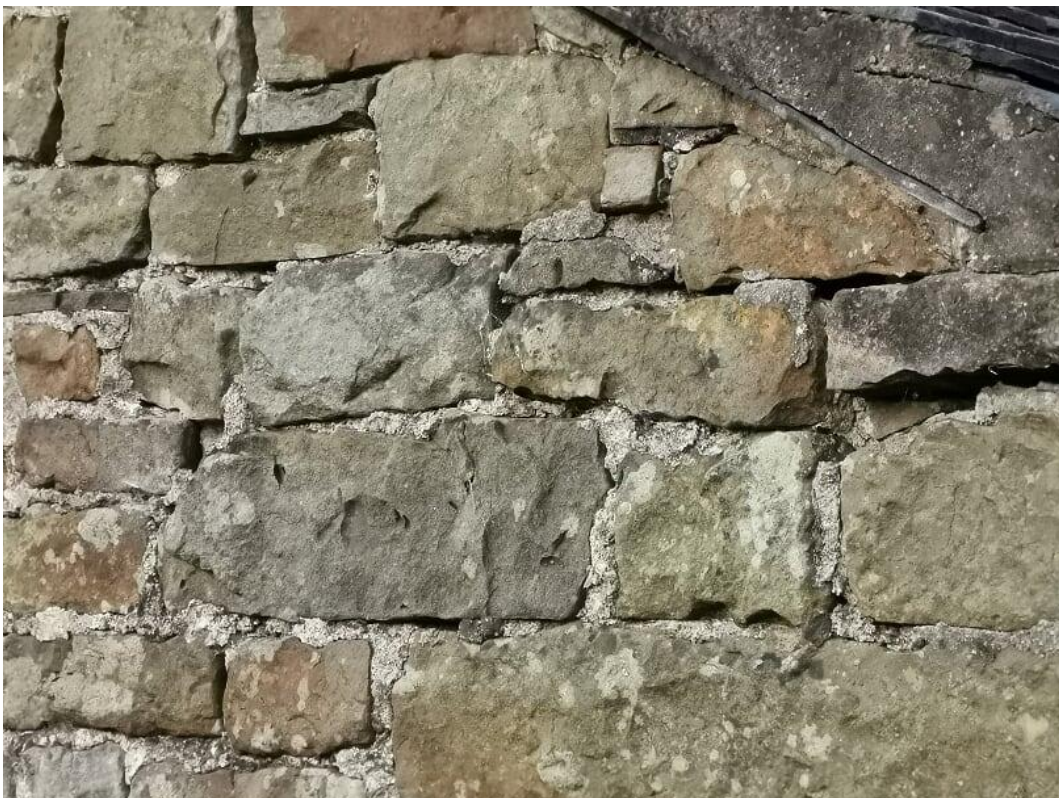


Plate 5: A photograph of the internal of the surveyed barn showing the membrane under the tiles.



Appendix E: The Annual Bat Year (BCT)

A Year in the Life of a Bat			
January		February	
	Hibernating; using up fat reserves.		Still hibernating; few fat reserves left.
March		April	
	Some activity; occasional bat seen feeding.		Awake and feeding at night.
May		June	
	Females looking for nursery sites.		Young born, usually only one.
July		August	
	Young still suckling.		Young start catching insects; females leave nursery to find males.
September		October	
	Mating season begins; start building fat reserves for hibernation.		Search for suitable hibernation site.
November		December	
	Hibernation begins although still some activity in warm weather.		Hibernating.

Appendix F: Legislation and Policy

All species of bat are fully protected under a variety of domestic, European and international legislation and conventions. These include:

- Bern Convention (Appendix II)
- Bonn Convention (Appendix II)
- Conservation Regulations (Northern Ireland) 1995
- Conservation of Habitats and Species Regulations 2017
- Countryside Rights of Way Act 2000
- Eurobats Agreement
- Habitats Directive (Annexes IV and II)
- Habitats Regulations 1994 (as amended) Scotland
- NERC Act 2006
- Wildlife and Countryside Act 1981 (as amended)
- Wild Mammals Protection Act

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.

National Planning Policy Framework, Section 15:

In early 2012, the National Planning Policy Framework (NPPF) replaced much previous planning policy guidance, including Planning Policy Statement 9: Biological and Geological Conservation. The government circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System, which accompanied PPS9, still remains valid. A presumption towards sustainable development is at the heart of the NPPF. This presumption does not apply however where developments require appropriate assessment under the Birds or Habitats Directives. The latest National Planning Policy Framework was updated in February 2019, with the section in relation to conserving the natural environment being located within section 15.

Section 15, on conserving and enhancing the natural environment, sets out how the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and, where possible, provide net gains in biodiversity. Opportunities to incorporate biodiversity gains into a development should be encouraged.

Biodiversity 2020:

This sets out to halt overall biodiversity loss and support healthy well-functioning ecosystems by establishing coherent ecological networks, with more and better places for nature, to the benefit of wildlife and people. The government's policy is aimed at individuals, communities, local authorities, charities, business and government, which all have a role to play in delivering Biodiversity 2020.

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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.