SHEPHERD NEAME



Part of the ES Group

QUEEN COURT FARM BARNS, OSPRINGE, FAVERSHAM, KENT

> Bat and Barn Owl Survey Report and Mitigation Strategy

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1. INTRODUCTION

1.1. Background

- 1.1.1. Ecology Solutions was instructed by Milliken and Company on behalf of Shepherd Neame Ltd in August 2018 to complete bat surveys on two barns associated with Queen Court Farm, Ospringe, Faversham, Kent (see Plan ECO1). Regard was also had to the potential presence of Barn Owls *Tyto alba*.
- 1.1.2. Both barns are proposed for conversion into residential properties, with work being undertaken internally and to the external aspects of the buildings.

1.2. Site Characteristics

- 1.2.1. The site lies in the south of the village of Ospringe, south-west of the market town of Faversham. The site forms part of Queen Court Farm and lies between Queen Court Farmhouse to south and agricultural buildings to the north and east. The site is bound by Water Lane to the west. The wider area is dominated by farmland.
- 1.2.2. The site comprises two large barns with associated outbuildings and hardstanding. Elements of scrub and lvy *Hedera helix* cover are present to the northern aspects of both barns (see Plan ECO2).

1.3. **Purpose of this Report**

- 1.3.1. This report sets out the results of the bat survey work undertaken by Ecology Solutions in 2018 and 2019.
- 1.3.2. Where necessary, mitigation measures are recommended so as to safeguard this faunal group within the site and, where appropriate, enhancement measures are put forward.

2. LEGISLATION AND ECOLOGY

2.1. Bats

Legislation and Licensing

- 2.1.1. All bats are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and included on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations"). These include provisions making it an offence to:
 - Deliberately kill, injure or take (capture) bats;
 - Deliberately disturb bats in such a way as to:-
 - be likely to impair their ability to survive, to breed or rear or nurture their young; or to hibernate or migrate; or
 - (ii) to affect significantly the local distribution or abundance of the species to which they belong;
 - Damage or destroy any breeding or resting place used by bats;
 - Intentionally or recklessly obstruct access to any place used by bats for shelter or protection (even if bats are not in residence).
- 2.1.2. The words deliberately and intentionally include actions where a court can infer that the defendant knew that the action taken would almost inevitably result in an offence, even if that was not the primary purpose of the act.
- 2.1.3. European Protected Species licences are available from Natural England in certain circumstances, and permit activities that would otherwise be considered an offence.
- 2.1.4. In accordance with the Habitats Regulations Natural England must apply the three derogation tests as part of the process of considering a licence application. These tests are that:
 - the activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety;
 - there must be no satisfactory alternative; and
 - the favourable conservation status of the species concerned must be maintained.
- 2.1.5. Licences can usually only be granted if the development is in receipt of full planning permission.

Ecology

- 2.1.6. There are seventeen breeding bat species in Britain. Many of them are considered threatened due to a variety of factors including habitat loss and disturbance / damage to roosts. Of these seventeen species, a number regularly use buildings as roost sites.
- 2.1.7. Bats are highly mobile flying mammals, which, in Britain, feed entirely on insects. They are able to fly and feed in the dark by

using a system of echolocation that gives them a 'sound picture' of their surroundings.

- 2.1.8. In winter when prey is scarce, British bats hibernate in humid parts of buildings, caves or hollow trees where temperatures are typically stable. They may wake occasionally but only become fully active again in the spring.
- 2.1.9. Female bats gather together in maternity roosts in summer to give birth and rear their single offspring. Like other mammals bats have fur and give birth to live young. Infant bats suckle on their mother's milk for several weeks until they can fly and hunt insects for themselves. Bats are long-lived mammals and some British species are known to live to over twenty-five years of age.

2.2. Barn Owls

- 2.2.1. Barn Owls are listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended), and therefore offences involving their nests, eggs or dependent young are subject to special penalties.
- 2.2.2. Barn Owl ranges can be up to 5,000ha in winter, but are smaller in summer (around 350ha) when food is more plentiful. Within that range a pair will use one or two nest sites and one to three roost sites, and potentially several other occasional roosts where limited signs of occupation will be present. Barn Owl ranges overlap, and so different pairs may use the same occasional roosts.
- 2.2.3. Barn Owls generally hunt at dusk and dawn, and prefer open rough grassland where prey such as voles, mice and shrews are abundant.

3. SURVEY METHODOLOGY

- 3.1. Field surveys were undertaken with regard to best practice guidelines issued by Natural England (2004¹), the Joint Nature Conservation Committee (2004²) and the Bat Conservation Trust (2016³).
- 3.2. Buildings B1 and B2 were subject to external surveys in September 2018. Checks of all buildings were undertaken in order to search for signs of any use by bats. Binoculars were used to inspect any inaccessible areas more closely.
- 3.3. The probability of a building being used by bats as a summer roost site increases if it:
 - is largely undisturbed;
 - dates from pre-20th Century;
 - has a large roof void with unobstructed flying spaces;
 - has access points for bats (though not too draughty);
 - has wooden cladding or hanging tiles;
 - is in a rural setting and close to woodland or water.
- 3.4. Conversely, the probability decreases if a building is of a modern or prefabricated design / construction, is in an urban setting, has small or cluttered roof voids, has few gaps at the eaves or is a heavily disturbed premises.
- 3.5. The main requirements for a winter / hibernation roost site are that it maintains a stable (cool) temperature and humidity. Sites commonly utilised by bats as winter roosts include cavities / holes in trees, underground sites and parts of buildings. Whilst different species may show a preference for one of these types of roost site, none are solely dependent on a single type.
- 3.6. All buildings considered to have some opportunities, even if limited, to support roosting bats were subject to further internal bat surveys by trained and experienced bat workers. The surveys targeted any internal loft void or attics which could provide suitable roosting opportunities for bats.
- 3.7. Evidence of the presence of bats was searched for with particular attention paid to the loft voids and gaps between rafters, joists and beams. Specific searches were made for bat droppings that can indicate present or past use and extent of use, as well as other signs to indicate the possible presence of bats e.g. feeding remains, presence of stained areas, or areas that are conspicuously cobweb-free.
- 3.8. Survey work was led by a Natural England bat licence holder.

¹ Mitchell-Jones, A. J. (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

² Mitchell-Jones, A.J. & McLeish, A.P. (Eds.) (2004). *Bat Workers' Manual*. 3rd edition. Joint Nature Conservation Committee, Peterborough.

³ Collins, J. (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3rd Edition. The Bat Conservation Trust, London.

- 3.9. As part of the internal survey work, regard was had to the presence of evidence of use by Barn Owls, such as pellets, feathers and guano, as well as to the potential presence of the owls themselves.
- 3.10. In addition to the internal and external surveys of buildings B1 and B2, two dusk emergence surveys were undertaken on 30 August 2018 and 22 May 2019, with and a dawn re-entry survey undertaken on 12 September 2018. The surveyors used iPads paired with Echo Meter Touch 2 PRO bat detectors to record the data, which was subsequently analysed using Kaleidoscope sound analysis software.
- 3.11. The survey methods undertaken aimed to identify any roosting bats leaving in the evening, using the wider site for foraging, or returning to the buildings in the morning to roost. The dusk surveys were undertaken from approximately 15 minutes before sunset until approximately two hours after sunset, and the dawn survey was undertaken approximately two hours before sunrise until approximately sunrise.
- 3.12. Surveys were conducted when the night-time temperature was above 10°C. The insectivorous diet of bats means there is little or no food available when temperature falls below this level and consequently levels of activity are low and may not accurately reflect the value of the application site for bats. The weather conditions for the surveys were recorded and any limitations noted.
- 3.13. Surveys were led by a licensed bat worker assisted by experienced surveyors.
- 3.14. Additional bat recording equipment (Songmeter SM4BAT) was deployed within buildings B1 and B2 to record any activity within these buildings.
- 3.15. Following the completion of the surveys all of the recorded data was analysed using the Kaleidoscope Viewer computer program.
- 3.16. Placement of the static bat detectors is shown on Plans ECO3a to ECO3c.

4. SITE DESCRIPTION

- 4.1. Building B1 is a large double-height single-storey barn, with a timber frame supporting red brick and wooden weather boarding to the walls and a pitched corrugated metal roof (see Photograph 1). Large wooden doors are present to the southern elevation, which support their own pitched roof. Two smaller single-storey units adjoin building B1 on its southern aspect (see Photograph 2). The most northernly unit, directly adjoining building B1, is a single-storey building that supports weatherboarding on the eastern and western aspects and a pitched corrugated metal roof. The more southerly unit is a two-storey building of breezeblock construction, supporting weather boarding to the upper half. The building supports a pitched bitumen felt roof.
- 4.2. Internally, Building B1 consists of a large traditional wooden mortice and tenon frame with a king post roof structure (see Photograph 3). The building is used for storage of various materials, as are the adjoining units.
- 4.3. Building B2 is of a similar construction to B1 but supports a pitched clay peg tile roof lined with bitumen felt, with a small section of the north-eastern roof having been replaced with corrugated asbestos panels (see Photograph 3). Internally the barn has been divided into three compartments. The northern compartment is a double-height single-storey barn which stood empty at the time of survey (see Photograph 4). Large wooden doors are present on the western aspect, supporting their own pitched roof. The wooden structure is similar to that of B1, with a mortice and tenon design, but with a queen post roof.
- 4.4. The middle section has been used as a workshop and shelving and miscellaneous items are present. Large skylights are also present on the eastern and western elevations. The southern compartment has been used previously as stables and supports a small loft void (see Photograph 6).

5. SURVEY RESULTS

5.1. Internal / External Inspections

Building B1

- 5.1.1. Multiple roosting opportunities for bats are present beneath the corrugated iron roof, above the internal ridge beam and within gaps in the mortice joints and brickwork.
- 5.1.2. Three small piles of bat droppings were identified inside the barn, below the ridge and mortice joints.
- 5.1.3. There was evidence of Barn Owl in the form of pellets and potentially guano. Evidence of Feral Pigeon *Columba livia* was also present. No birds were seen during the internal survey, though a sighting of Barn Owl inside building B1 was reported to Ecology Solutions by the project architect.
- 5.1.4. The bat droppings were collected and sent for DNA analysis to ascertain the species from which they derived. The results of the DNA analysis for all samples were returned as Natterer's Bat *Myotis nattereri*.
- 5.1.5. This suggests that Natterer's Bat is roosting in at least three locations within the barn structure. The absence of accumulated droppings would not preclude the possibility that further roosts are present in other joints within the building.

Building B2

- 5.1.6. Roosting opportunities are present beneath loose clay roof tiles and also inside the building above the ridge beam and in gaps in the mortice joints. Evidence of bats was present in the form of droppings, urine splashes and scattered insect wings.
- 5.1.7. Droppings were present beneath the ridge, within the loft void above the stable and beneath a former strip light fitting.
- 5.1.8. These bat droppings were also collected and sent for DNA analysis, with results identifying the use of the building by both Natterer's Bat and Brown Long-eared Bat *Plecotus auritus*.

5.2. Activity Surveys

- 5.2.1. Two emergence surveys were completed on 30 August 2018 and 22 May 2019. A dawn re-entry survey was undertaken on 12 September 2018.
- 5.2.2. Weather conditions presented a partial constraint to the re-entry survey undertaken on 12 September 2018, with light showers throughout the survey. Temperatures were between 16°C and 15.5°C and there was a light breeze. The dusk emergence surveys were undertaken in favourable weather conditions: the temperature was mild, there was no precipitation and there was little wind.

Conditions and timings of the surveys are summarised in Table 5.1 below.

5.2.3. Results from the activity bat surveys are illustrated on Plans ECO3a to ECO3c.

Date	30.08.18	12.09.18	22.05.19
Survey Type	Dusk emergence	Dawn re-entry	Dusk emergence
Sunset / Sunrise	19:48	06:28	20:50
Survey Start	Survey Start 19:33		20:35
Survey End	21:48	06:43	22:50
Cloud Cover (%)	37	100	12
Temperature (°C)	nperature 17-12		13-11
Weather & Wind	Dry, light breeze	Showers, light breeze	Dry, moderate breeze

 Table 5.1.
 Bat activity survey conditions and timings.

Emergence Survey 30.08.18

- 5.2.4. A single Common Pipistrelle was seen emerging from beneath the apex roof above the double doors to the south of building B1 at 19:59, 11 minutes after sunset. Another possible Common Pipistrelle emergence was seen to the eastern end of building B1 at 20:00, 12 minutes after sunset (see Plan ECO3a).
- 5.2.5. A single *Myotis* sp. was observed entering building B2 above the double doors on the western aspect at 20:25 and 20:32.
- 5.2.6. A high level of activity was recorded around buildings B1 and B2. The main activity was recorded within the courtyard that lies to the south of building B1 and the east of building B2. A similarly high level of activity was recorded to the west of building B2, with lower levels of activity recorded to the east of building B1.
- 5.2.7. The majority of registrations were attributed to Common Pipistrelle, with Soprano Pipistrelle, Brown Long-eared Bat and *Myotis* sp. also being recorded, albeit less frequently (see Table 5.2). The earliest registration was recorded 11 minutes after sunset and is attributed to a Common Pipistrelle.

Survey Month	Position	Species	Number of Registrations	First registration after Sunset
		Ppip	132	19 minutes
	1	Ра	2	43 minutes
		Муо	17	35 minutes
	2	Ppip	131	11 minutes
		Рруд	1	44 minutes
		Pa	1	1 hour 59 minutes
August		Муо	21	36 minutes
	3	Ppip	73	12 minutes
		Pa	14	42 minutes
		Муо	4	35 minutes
		Ppip	71	46 minutes
	4	Pa	23	38 minutes
		Муо	3	35 minutes
Total		5	493	

Table 5.2. Bat emergence survey results for August 2018⁴.

Re-entry Survey 12.09.18

- 5.2.8. Owing to the rain showers, surveyors spent the majority of the survey within buildings B1 and B2, observing the bat activity inside the buildings.
- 5.2.9. A single Common Pipistrelle or *Myotis* sp. was observed repeatedly landing and entering a mortice joint at the eastern end of building B1 between 05:30 and 05:40 (see Plan ECO3b).
- 5.2.10. Activity levels within both buildings was high, with 437 registrations overall (see Table 5.3). Common Pipistrelle and *Myotis* sp. were both recorded within building B1, with Common Pipistrelle, Soprano Pipistrelle, *Myotis* sp. and Brown Long-eared Bat all recorded within building B2.

⁴In all cases the following abbreviations are used: Bb/Barbastelle Barbastella barbastellus; Es/Serotine *Eptesicus serotinus*; Myo/*Myotis* species; Md/Daubenton's *Myotis daubentonii*; Nn/Noctule *Nyctalus noctula*; Nl/Leisler's Bat *Nyctalus leisleri*; Nyc/*Nyctalus* species; Pa/Brown Long-eared Bat *Plecotus auritus*; Psp/Pipistrelle species; Pnat/Nathusius' Pipistrelle *Pipistrellus nathusii*; Ppip/Common Pipistrelle *Pipistrellus pygmaeus* and Un/Unidentified bat.

Survey Month	Position	Species	Number of Registrations	Last registration before Sunrise
	1	Ppip	70	42 minutes
	I	Муо	30	1 hour 15 minutes
	2	Ppip	9	38 minutes
	2	Муо	43	1 hour 12 minutes
Sontombor	3	Ppip	84	44 minutes
September		Рруд	3	1 hour 7 minutes
		Pa	13	1 hour 32 minutes
		Муо	23	1 hour 14 minutes
	4	Ppip	63	44 minutes
	4	Муо	99	50 minutes
Tota	1	5	437	

Table 5.3. Bat re-entry survey results for September 2018.

Emergence Survey 22.05.19

- 5.2.11. An unidentified bat was seen emerging from above the double doors on the western aspect of building B2 at 21:14, 24 minutes after sunset. The behaviour of the bat compared to that of the later identified *Myotis* sp. would suggest that it was the same species. A maximum of two *Myotis* sp. were seen emerging and re-entering the building above the doors at any one time (see Plan ECO3c).
- 5.2.12. A possible emergence of three Common Pipistrelles was observed from the northern end of building B2 at 21:24, 34 minutes after sunset, with a further possible emergence of a single Common Pipistrelle from the north-eastern corner of building B2 at 21:25.
- 5.2.13. A similar composition of species was recorded as was observed during the previous surveys (see Table 5.4). Activity levels were again high, with the main activity recorded to the east of building B1 and the west of building B2. The earliest registration was recorded at 21:13, approximately 23 minutes after sunset. This was attributed to the Common Pipistrelle. Other species recorded include Soprano Pipistrelle, Brown Long-eared Bat, *Myotis* sp. and Noctule Bat.

Survey Month	Position	Species	Number of Registrations	First registration after Sunset
		Ppip	128	31 minutes
	1	Ра	1	1 hour 51 minutes
	1	Муо	30	26 minutes
		Nn	1	1 hour 5 minutes
		Ppip	54	26 minutes
		Рруд	20	58 minutes
	2	Ра	2	1 hour 47 minutes
Мау		Муо	2	1 hour 25 minutes
		Nn	1	1 hour 5 minutes
	3	Ppip	148	23 minutes
		Ppyg	17	37 minutes
		Ра	1	1 hour 13 minutes
		Муо	2	40 minutes
		Nn	1	1 hour 4 minutes
		Ppip	165	32 minutes
	Λ	Рруд	11	58 minutes
	4	Ра	6	58 minutes
		Муо	4	56 minutes
Tota	I	5	594	

Table 5.4. Bat emergence survey results for May 2019.

5.3. **Remote Surveys**

Building B1

- 5.3.1. A static SM4BAT detector was placed within the barn for five to six consecutive nights to coincide with the three activity surveys carried out on 30 August and 12 September 2018 and 22 May 2019.
- 5.3.2. The static SM4BAT detector deployed between 29 August and 4 September 2018 recorded a total of 1836 registrations across six nights (see Table 5.5). A total of four species were recorded, with the majority of registrations attributed to Common Pipistrelle. The other species recorded were Soprano Pipistrelle, Brown Longeared Bat and *Myotis* sp.
- 5.3.3. The earliest registration recorded by the detector was attributed to a Common Pipistrelle, recorded approximately 13 minutes before sunset. The last registration recorded was also attributed to Common Pipistrelle, approximately 23 minutes before sunrise.

Survey Nights	Location	Species	Number of Registrations	First registration after Sunset	Last Registration before Sunrise
29.08.18 - 04.09.18 (6 nights)	1	Ppip	868	13 minutes before sunset	23 minutes
		Рруд	37	14 minutes	1 hour 55 minutes
		Pa	312	1 hour 17 minutes	57 minutes
		Муо	619	28 minutes	44 minutes
	Total	4	1836		

Table 5.5. Static SM4BAT detector results deployed within building B1between 29.08.18 and 04.09.18.

- 5.3.4. The static SM4BAT detector deployed between 12 September and 17 September 2018 recorded a total of 1233 registrations across five nights (see Table 5.6). Six species were recorded, the majority of registrations being attributed to Common Pipistrelle. Other species recorded were Soprano Pipistrelle, Brown Long-eared Bat, Noctule Bat, Nyctalus sp. and Myotis sp.
- 5.3.5. The earliest and latest registrations recorded by the detector were attributed to Common Pipistrelle, recorded approximately 17 minutes before sunset and 19 minutes before sunrise. Soprano Pipistrelle was also recorded nine minutes after sunset, suggesting a roost for this species is either present within or close to the building.

Survey Nights	Location	Species	Number of Registrations	First registration after Sunset	Last Registration before Sunrise
	1	Ppip	729	17 minutes before sunset	19 minutes
12 00 18		Рруд	24	9 minutes	1 hour 37 minutes
17.09.18 - (5 nights)		Pa	75	2 hours 27 minutes	30 minutes
		Nyc	6	42 minutes	
		Nn	3	4 hours 42 minutes	1 hour 57 minutes
		Муо	396	32 minutes	29 minutes
	Total	6	1233		

Table 5.6. Static SM4BAT detector results deployed within building B1

 between 12.09.18 and 17.09.18.

- 5.3.6. The static SM4BAT detector deployed between 6 June and 11 June 2019 recorded a total of 608 registrations across five nights (see Table 5.7). Three species were recorded; most records were attributed to Common Pipistrelle, with Soprano Pipistrelle and *Myotis* sp. also present.
- 5.3.7. The earliest and latest registrations recorded by the detector were again attributed to Common Pipistrelle, recorded approximately six minutes before sunset and 27 minutes before sunrise.

Survey Nights	Location	Species	Number of Registrations	First registration after Sunset	Last Registration before Sunrise
06.06.19 - 11.06.19 (5 nights)	1	Ppip	488	6 minutes before sunset	27 minutes
		Рруд	1		4 hours 32 minutes
		Муо	119	38 minutes	1 hour 46 minutes
	Total	3	608		

Table 5.7. Static SM4BAT detector results deployed within building B1between 06.06.19 and 11.06.19.

- 5.3.8. The timing of the earliest and latest registrations over the course of the remote surveys suggests that a number of bats are using building B1 for roosting as well as foraging.
 - Common Pipistrelle was recorded before sunset during every survey period and then 20 to 30 minutes before sunrise, which would correspond to early activity and then returning to the roost before sunrise;
 - It is less clear with respect to Soprano Pipistrelles, but first registrations shortly after sunset suggest this is a possibility, albeit the final registrations were all well before sunrise;
 - The first record of Brown Long-eared Bat during the August surveys corresponds to the approximate time after sunset at which this species generally emerges, while the final record before sunrise would also suggest roosting in the structure. The other survey results are less clear;
 - The first and last records of *Myotis* sp. throughout the survey period strongly suggest that a roost is present in the structure (this would be Natterer's Bat in light of the eDNA evidence).

Building B2

- 5.3.9. A static SM4BAT detector was deployed within the northern compartment of Building B2 for five to six consecutive nights to coincide with the activity surveys carried out on 12 September 2018 and 22 May 2019.
- 5.3.10. The detector deployed between 12 September and 17 September 2018 recorded a total of 1631 registrations across the five nights (see Table 5.8). Six species were recorded; the majority of records were attributed to *Myotis* sp., with the other Common Pipistrelle, Soprano Pipistrelle, Brown Long-eared Bat, Noctule Bat and *Nyctalus* sp. also present. Given the other evidence, all *Myotis* records are likely to be Natterer's Bat.
- 5.3.11. The earliest and latest registrations recorded by the detector were attributed to Common Pipistrelle, recorded approximately five minutes after sunset and 20 minutes before sunrise.

Survey Nights	Location	Species	Number of Registrations	First registration after Sunset	Last Registration before Sunrise
		Ppip	611	5 minutes	20 minutes
	2	Рруд	61	21 minutes	1 hour 12 minutes
12.09.18 - 17.09.18 (5 nights)		Pa	90	3 hours 36 minutes	30 minutes
		Nyc	1	4 hours 37 minutes	
		Nn	2		2 hours 3 minutes
		Муо	866	12 minutes	29 minutes
	Total	6	1631		

Table 5.8. Static SM4BAT detector results deployed within building B2between 12.09.18 and 17.09.18.

- 5.3.12. The detector deployed between 22 May and 28 May 2019 recorded a total of 1544 registrations across the six nights, attributed to four species (see Table 5.9). The majority of the registrations recorded were for *Myotis* sp. and Common Pipistrelle, with 675 and 616 registrations respectively. Given the other evidence, all *Myotis* records are likely to be Natterer's Bat. Other species recorded were Soprano Pipistrelle and Brown Long-eared Bat.
- 5.3.13. The earliest and latest registrations were attributed to Common Pipistrelle, recorded approximately 22 minutes after sunset and 27 minutes before sunrise.

Survey Nights	Location	Species	Number of Registrations	First registration after Sunset	Last Registration before Sunrise
22.05.19 - 28.05.19 (6 nights)	2	Ppip	616	22 minutes	27 minutes
		Рруд	197	50 minutes	32 minutes
		Pa	56	1 hour 5 minutes	28 minutes
		Муо	675	31 minutes	34 minutes
	Total	4	1544		

Table 5.9. Static SM4BAT detector results deployed within building B2between 22.05.19 and 28.05.19.

- 5.3.14. The timing of the earliest and latest registrations over the course of the remote surveys suggests that a number of bats are using building B2 for roosting as well as foraging.
 - Common Pipistrelle was recorded five minutes after sunset and then 20 minutes before sunrise, which would correspond to early activity and then returning to the roost before sunrise. This is supported by the evidence of the May emergence survey (see above);
 - It is less clear with respect to Soprano Pipistrelles, but a first registration 21 minutes after sunset and a last

registration 32 minutes before sunrise suggests this is a possibility;

- The first record of Brown Long-eared Bat during the May surveys corresponds to the approximate time after sunset at which this species generally emerges, while the final record before sunrise would also suggest roosting in the structure (it is noted that droppings were confirmed by the eDNA analysis, which would further support this theory);
- The first and last records of *Myotis* sp. strongly suggest that a roost is present in the structure (this would be Natterer's Bat in light of the eDNA evidence).
- 5.3.15. The record for *Nyctalus* species is considered to be incidental, with the microphone picking up an individual outside the building.

5.4. Summary

5.4.1. Table 5.10 below summarises the use of Building B1 by bats and classifies the roost types present.

Bat Species	Roost Type	
	Day Roost	Feeding Roost
Natterer's Bat	Yes – at least three locations	Yes
Common Pipistrelle	Yes – single bat	Yes
Soprano Pipistrelle	Possible	Yes
Brown Long-eared Bat	Possible	Yes

 Table 5.10.
 Summary of use of Building B1.

5.4.2. The use of Building B2 is summarised in Table 5.11 below.

Bat Species	Roost Type	
	Day Roost	Feeding Roost
Natterer's Bat	Yes – two bats	Yes
Common Pipistrelle	Yes	Yes
Soprano Pipistrelle	Possible	Yes
Brown Long-eared Bat	Likely	Yes

Table 5.11. Summary of use of Building B2.

6. DISCUSSION AND RECOMMENDATIONS

6.1. Use of Buildings

B1

- 6.1.1. The results of the internal survey work undertaken highlighted the use of the barn by Natterer's Bat with droppings found beneath the ridge and mortice joints in three locations.
- 6.1.2. A single Common Pipistrelle was observed emerging from the apex of the roof structure above the double doors in August 2018, with another possible emergence observed from the eastern end of the building.
- 6.1.3. A single Common Pipistrelle or *Myotis* sp. was also observed repeatedly landing by and entering a gap in a mortice joint at the western end of the building during the re-entry survey undertaken in September 2018.
- 6.1.4. The results of the emergence and re-entry surveys, as well as the deployment of the static SM4BAT detector placed within the building on three occasions also show that the building is used for foraging by a number of bat species including *Myotis* sp., Common Pipistrelle, Soprano Pipistrelle and Brown Long-eared Bat.
- 6.1.5. The timing of registrations on the static detector supports the theory of day roosts of Natterer's Bat and Common Pipistrelle, with day roosts of Soprano Pipistrelle and Brown Long-eared Bat being possibilities.
- 6.1.6. Barn Owl was seen to be using the building, though there was no evidence of breeding. On this basis the building is considered to be an occasional roost.

B2

- 6.1.7. The results of the internal survey work undertaken highlighted the use of the barn by bats with droppings, urine splashes and scattered insect wings all recorded. The results of the droppings sent for eDNA testing concluded that Natterer's Bat and Brown Long-eared Bats were present.
- 6.1.8. During the emergence survey undertaken in August 2018 *Myotis* sp. were seen entering and leaving the barn above the double doors on the western aspect, although at this time it was unclear whether a proper emergence had occurred.
- 6.1.9. An emergence of a single *Myotis* sp. was observed from above the doors to the west of the building in May 2019. Two bats were seen then entering and leaving at this point, suggesting that the roost supports at least two bats.
- 6.1.10. Identifying *Myotis* species calls from one another is a difficult practise and not typically done. However, the results of the eDNA

testing identified Natterer's Bat within the buildings and it is therefore considered likely the species of *Myotis* that has been recorded during the surveys is Natterer's Bat.

- 6.1.11. As with building B1, the results of the surveys, as well as the deployment of the static detector show that the building is being used for foraging by *Myotis* sp., Common Pipistrelle, Soprano Pipistrelle and Brown Long-eared Bat.
- 6.1.12. The timing of registrations on the static detector supports the theory of day roosts of Natterer's Bat and Common Pipistrelle, with a day roost of Soprano Pipistrelle being possible and for Brown Long-eared Bat considered likely (a point supported by the droppings analysis).

6.2. **Proposals and Effect**

- 6.2.1. It is considered that the renovation and conversion of both buildings will result in the loss of identified bat roosts and were proposals to proceed in the absence of mitigation there is potential for bats to be killed and / or injured during the process. There is also significant potential for bats to be disturbed within the roosts present. These actions would be offences under the legislation cited earlier in the report and as such, a Natural England European Protected Species (EPS) licence would be required.
- 6.2.2. The conversion would result in the loss of opportunities for Barn Owls.

6.3. Mitigation and Enhancement

Conservation Significance

6.3.1. Reference to Natural England's *Bat Mitigation Guidelines* is instructive in formulating appropriate mitigation measures to offset the bat interest identified within the site.

Natterer's Bats

- 6.3.2. Natterer's Bats are scarce across the whole of the UK and few summer roosts have been found in Kent. The evidence suggests that day roosts of at least three bats are present in B1, and two bats in B2. The conservation significance of this is relatively low.
- 6.3.3. The mitigation / compensation requirement as stated in the Bat Mitigation Guidelines for small numbers of rarer species; not a maternity site would be provision of new roost facilities where possible. Need not be exactly like-for-like, but should be suitable, based on species' requirements. Minimal timing constraints or monitoring requirements.
- 6.3.4. For feeding perches of common / rarer species, which are of low conservation significance, the requirement is for *flexibility over* provision of bat boxes, access to new buildings etc.; no conditions about timing or monitoring.

Common Pipistrelles

- 6.3.5. Common Pipistrelles are the UK's most common bat species. A single day roost was recorded in building B1; evidence suggests a day roost is present in B2; and bats were also recorded foraging in both structures.
- 6.3.6. The conservation significance of roosts of individual bats of common species is low, as is the significance of feeding areas of common species. The mitigation requirement according to the Bat Mitigation Guidelines is flexibility over provision of bat boxes, access to new buildings etc.; no conditions about timing or monitoring.

Soprano Pipistrelles

- 6.3.7. Soprano Pipistrelles are the UK's second most common bat species. This species was recorded foraging inside both buildings, and a day roost in each of B1 and B2 is considered possible due to the remote detector evidence.
- 6.3.8. As for other species, the conservation significance is low, and the mitigation requirement as for Common Pipistrelles above.

Brown Long-eared Bats

- 6.3.9. This species is common and widespread across the UK. It was recorded feeding inside both buildings, while a day roost in B2 is considered likely in light of remote detector recordings and droppings analysis (a day roost in B1 is considered a possibility but the evidence is less convincing).
- 6.3.10. As for other species, the conservation significance of these roosts is low, and the mitigation requirement as for Common Pipistrelles above.

Licensing

- 6.3.11. Owing to the presence of varying roosts present on site the proposals would need to be undertaken under a European Protected Species licence from Natural England.
- 6.3.12. The licence application would be accompanied by a method statement and reasoned statement of application. These documents would set out the means by which the requirements of the three derogation tests of the Habitats Regulations would be met. These are considered briefly as follows:
 - Imperative reasons of overriding public interest the development is in line with local and national planning policy, and consent is expected to be granted by the Local Planning Authority on this basis. The development meets national and local needs for additional housing;

- No satisfactory alternative there is no satisfactory alternative to the renovation of the existing building. Were it not to be repaired it would fall into further disrepair and the roost would eventually be lost;
- Maintain favourable conservation status this test would be met, though a series of mitigation and enhancement measures as set out below.

Timing of Works

6.3.13. It is recommended that renovation works be undertaken between October and May, outside of the sensitive season to avoid disturbance.

Approach to Renovation Works

- 6.3.14. Work will not be commenced until the project is in receipt of a Natural England EPS licence.
- 6.3.15. Work will only be undertaken during favourable weather conditions and not during heavy rain, high winds or temperatures below 5°C.
- 6.3.16. It is recommended that works be undertaken between October and May, outside of the sensitive season, meaning that disturbance will be avoided.
- 6.3.17. Any identified roosting feature will be excluded using one-way excluding devices, where necessary, prior to any renovation work beginning.
- 6.3.18. Any roof tiles that are to be removed will be stripped by hand under the supervision of a suitably qualified ecologist. The roof tiles will be removed from the ridge downwards.
- 6.3.19. Particular care will be taken in the handling of old timbers, such as fascia or weatherboarding, with attention paid to the potential presence of bats in crevices.
- 6.3.20. Any suitable roosting features will be checked by an ecologist before they are removed and any bats found moved to a prepared holding box and will be released at a suitable time during that evening.
- 6.3.21. Before the start of renovation work, contractors will be briefed as to the potential presence of bats. Contractors will be informed of their legal responsibilities, and instructed to seek advice from a licensed bat worker in the unlikely event that a bat is uncovered during the work.

Retaining Opportunities for Bats

6.3.22. Breathable roof membrane will be avoided in areas where opportunities for bats are to be provided (i.e. the bat loft and bat tiles – see below), since this has been found to present a high risk

of entangling bats and eventually killing them, as well as damaging the membrane itself and affecting its function. Only bituminous roofing felt that does not contain polypropylene filaments will be used.

- 6.3.23. The renovations will ultimately prevent bats from accessing the large interior spaces of the buildings. A dedicated bat loft will be installed at the eastern end of Building B1 (which is referred to as Barn 2 in the application drawings), measuring 5.3m x 5.1m x 2.5m. The void will be accessible to bats through a raised ridge tile. Existing mortise joints in the void area will be retained, and roughened wooden panels should be affixed to the interior of the void to provide further roosting opportunities.
- 6.3.24. A further six bat access tiles will be incorporated into the roof of both buildings B1 and B2 to retain roosting opportunities for Pipistrelle species post-renovation. These will be installed on the south-facing elevations.
- 6.3.25. Furthermore, care will be taken in the placement of external lighting to ensure that no lights are placed near the entrance / exit points of new roost sites and that LED lights or similar with hoods lights to direct light downwards are employed to reduce light spillage.

Retaining Opportunities for Barn Owls

6.3.26. A new garage structure is to be constructed to the east of the existing buildings. This will be constructed in a similar style and house a series of double garages, above which is to be a series of partitioned loft voids. The eastern end of the building is to feature a gable end, and an integrated Barn Owl nesting area is included in the design, established according to parameters set out by the Barn Owl Trust. A external exercise ledge is included, while the eastern end of the building faces onto open land, so the hole (130mm x 250mm) will be easily visible and accessible to Barn Owls. A small access hatch will be provided for periodic cleaning.

7. SUMMARY AND CONCLUSIONS

- 7.1. Ecology Solutions was instructed by Milliken and Company on behalf of Shepherd Neame Ltd in August 2018 to complete bat surveys on two barns associated with Queen Court Farm, Ospringe, Faversham, Kent.
- 7.2. Both barns are proposed for conversion into residential properties, with work being undertaken internally and to the external aspects of the buildings.
- 7.3. Surveys were undertaken by Ecology Solutions in August / September 2018 and May / June 2019.
- 7.4. The results of the internal survey work undertaken highlighted the use of the building B1 by Natterer's Bat and building B2 by Natterer's Bat and Brown Long-eared Bat.
- 7.5. A single Common Pipistrelle was observed emerging from the apex over the doors on the southern elevation of building B1 in August 2018. Another potential Common Pipistrelle emergence was observed from the eastern end of building B1 on the same evening. During the re-entry survey undertaken in September 2018, A single Common Pipistrelle or *Myotis* sp. was seen repeatedly landing on and entering a gap within a mortice joint at the western end of the building.
- 7.6. *Myotis* sp. were seen entering and leaving building B2 above the doors on the western elevation in August 2018 and confirmed emerging from this same location in May 2019. Two possible emergences for Common Pipistrelle were observed from the northern aspect and north-western corner of building B2 in May 2019.
- 7.7. The timing of the earliest and latest registrations over the course of the remote surveys suggests that a number of bats are using both buildings for roosting. Building B1 is considered to support a day roost of Common Pipistrelle; day roosts of Soprano Pipistrelle and Brown Long-eared Bats are possibilities; a day roost of Natterer's Bat is present. All four species were recorded using building B1 for feeding. Building B2 is considered to support a day roost of Common Pipistrelle is a possibility, while one of Brown Long-eared Bats is likely; a day roost of Natterer's Bat is present. All four species were recorded using building B1 for feeding. All four species were recorded using building B2 for feeding.
- 7.8. Owing to the presence of multiple day roosts across both buildings, the actions proposed would need to be undertaken under a European Protected Species licence from Natural England.
- 7.9. Evidence of use by Barn Owls was noted in building B1, and a Barn Owl was seen inside by the project architect.
- 7.10. Before the start of any renovation work, contractors will be briefed as to the potential presence of bats. Contractors will be informed of their legal responsibilities, and instructed to seek advice from a licensed bat worker in the unlikely event that a bat is uncovered during the work.

- 7.11. It is recommended that renovation works be undertaken between October and May, outside of the sensitive season to avoid disturbance.
- 7.12. Any identified roosting feature will be excluded using one-way excluding devices, where necessary, prior to any demolition or renovation work beginning and any roof tiles that are to be removed will be stripped by hand under the supervision of a suitably qualified ecologist.
- 7.13. Any suitable roosting features will be checked by an ecologist prior to their removal and any bats found moved to a prepared holding box and will be released at a suitable time during that evening.
- 7.14. Breathable roof membrane will be avoided in areas where opportunities for bats are to be provided (i.e. the bat loft and bat tiles see below). Only bituminous roofing felt that does not contain polypropylene filaments will be used.
- 7.15. A dedicated bat loft will be installed at the eastern end of Building B1 (which is referred to as Barn 2 in the application drawings), measuring 5.3m x 5.1m x 2.5m. The void will be accessible to bats through a raised ridge tile. Existing mortise joints in the void area will be retained, and roughened wooden panels should be affixed to the interior of the void to provide further roosting opportunities.
- 7.16. A further six bat access tiles will be incorporated into the roof of both buildings B1 and B2 to retain roosting opportunities for Pipistrelle species post-renovation. These will be installed on the south-facing elevations.
- 7.17. Furthermore, care will be taken in the placement of external lighting to ensure that no lights are placed near the entrance / exit points of new roost sites and that LED lights or similar with hoods lights to direct light downwards are employed to reduce light spillage.
- 7.18. An integrated Barn Owl nesting area, established according to parameters set out by the Barn Owl Trust, is included in the design of the new garage structure to be constructed to the east of the existing buildings. A external exercise ledge is included, while the eastern gable end of the building faces onto open land, so the hole will be easily visible and accessible to Barn Owls.
- 7.19. In conclusion, the survey work undertaken at the site has recorded evidence of multiple bat day roosts and feeding areas, as well as use by Barn Owls. The renovation of buildings B1 and B2 will require a Natural England European Protected Species licence. The measures set out in this report will ensure that the favourable conservation status of the species concerned is maintained in the locality, as well as retaining opportunities for Barn Owls.

PLANS

PLAN ECO1

Site Location and Ecological Designations



PLAN ECO2

Ecological Features



QUEEN COURT FARM BARNS, OSPRINGE, FAVERSHAM, KENT

7867:

Cokenach Estate Barkway | Royston Hertfordshire | SG8 8DL

+44(0)1763 848084 east@ecologysolutions.co.uk ecologysolutions.co.uk

PLAN ECO2: ECOLOGICAL FEATURES

Rev: A

Ν

Aug 2019

PLAN ECO3a

Bat Emergence Survey Results 30.08.18





