

BAT SURVEY

CHAREHEAD BARN, ACOMB, NORTHUMBERLAND



JUNE 2021

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PROJECT NAME Charehead Barn
PROJECT NUMBER 6456

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A. SUMMARY

It is proposed to convert a small barn at Charehead, Acomb to residential use.

Consultation with the MAGIC website¹ indicated that there are no protected sites listed for bats within 2km. It is within a Site of Special Scientific Interest (SSSI) Impact Risk Zone (IRZ), the terms of which are not relevant to this site.

Initial site inspection was undertaken on 27th October 2020 and comprised a detailed inspection of the structures. Presence/absence surveys were undertaken in May 2021.

The site is situated in an area dominated by the village of Acomb, with woodland, pasture and arable land surrounding the village. Overall, the habitats present in the local area are of moderate suitability for use by foraging/commuting bats.

The building is a small, single storey stone barn with a slate roof. There are a number of large cracks in the stonework to the north, and potential access under the ridge tiles. The roof is unlined and the front elevation relatively well pointed. Overall, given its small size and lack of roof lining, it is considered of low to moderate suitability, but likely to be used by no more than a small number of bats.

Thorough internal and external inspection of the building recorded no field signs.

Two presence/absence surveys were undertaken in early and late May 2021. No roosts were identified. Activity was generally low, with small numbers of common and soprano pipistrelle and *Myotis* passes during the dusk survey, and common pipistrelle and noctule during the dawn survey.

Nesting birds may use the building, with evidence of old nests recorded.

Potential impacts of the development include:

- The loss of a small number of potential crevice roost sites.
- Disturbance or harm to a small number of bats that may be using the building at the time of proposed works, potentially including hibernating bats if works are undertaken during the winter.
- Increased lighting and disturbance around the site.
- Harm/disturbance to nesting birds.

Key mitigation measures include:

- Works will follow a precautionary bat method statement. The key work methods required include careful removal of roof coverings and loose stonework by hand.
- Key works, including roof stripping and exposure of wall tops, will not be undertaken between November and February.
- Lighting around the site will be low level and low lux.
- Four roosting opportunities will be incorporated into the conversion.
- In advance of the start of works 1 bat box will be erected in adjacent trees, within the site owner's landholding, to provide alternative roost sites.
- A check for nesting birds will be undertaken by a suitably experienced ornithologist if building conversion works commence between March and August inclusive.

¹ MAGIC website: www.magic.gov.uk

The local planning authority and Natural England are likely to require the means of delivery of the mitigation to be identified. It is recommended that mitigation and enhancement proposals are incorporated into the planning documents.

If you are assessing this report for a local planning authority and have any difficulties interpreting plans and figures from a scanned version of the report, E3 Ecology Ltd would be happy to email a PDF copy to you. Please contact us on 01434 230982.

B. INTRODUCTION

E3 Ecology Ltd was commissioned by Mr Harris in October 2020 to undertake a daytime bat risk assessment of Charehead barn, Acomb. Presence/absence surveys were undertaken in May 2021.

The purpose of this report is:

- To detail the results of the survey work of the building on site that has been undertaken for bats.
- To provide recommendations to be incorporated into the design for the site.
- To provide recommendations for further survey work, where required.
- To set out the mitigation measures required to ensure compliance with nature conservation legislation and to address any potentially significant effects.
- To identify appropriate enhancement measures.

The site is located in Acomb at an approximate central grid reference of NY 93356 66557.

The figures below illustrate firstly the site boundary and secondly, to provide context, the broad habitats present on site and within an approximate 500m buffer zone.

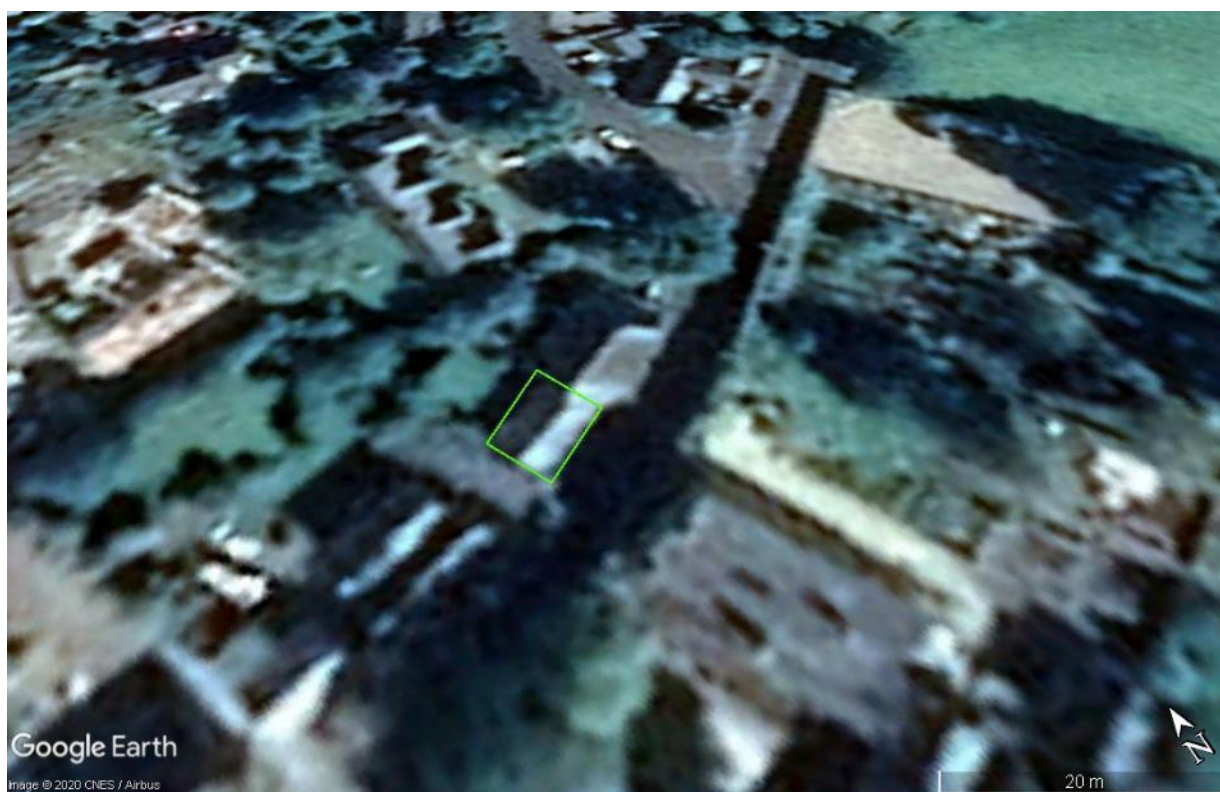


FIGURE 1: SITE BOUNDARY
(Reproduced under licence from Google Earth Pro.)

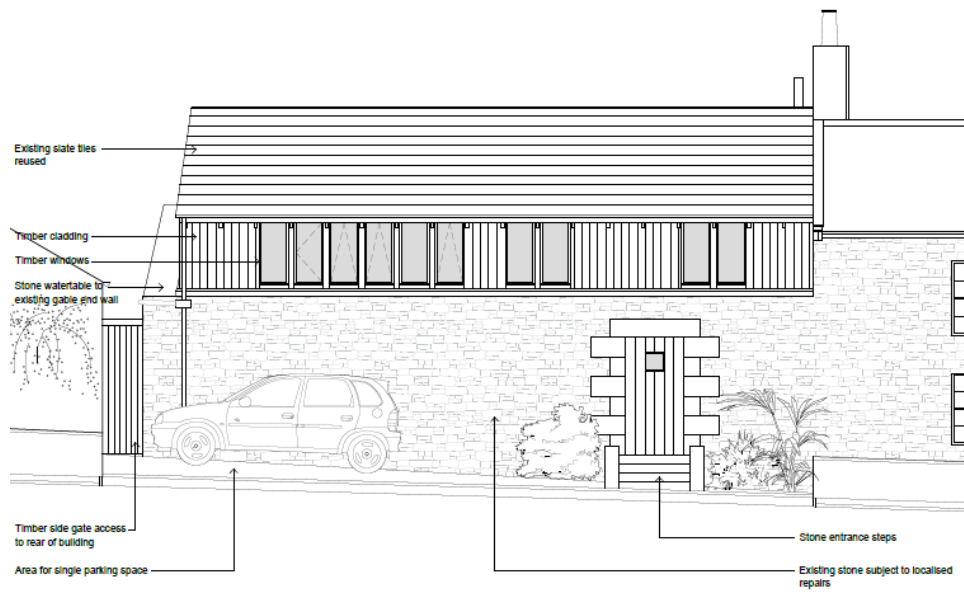


FIGURE 2: SITE AND SETTING
(Reproduced under licence from Google Earth Pro.)

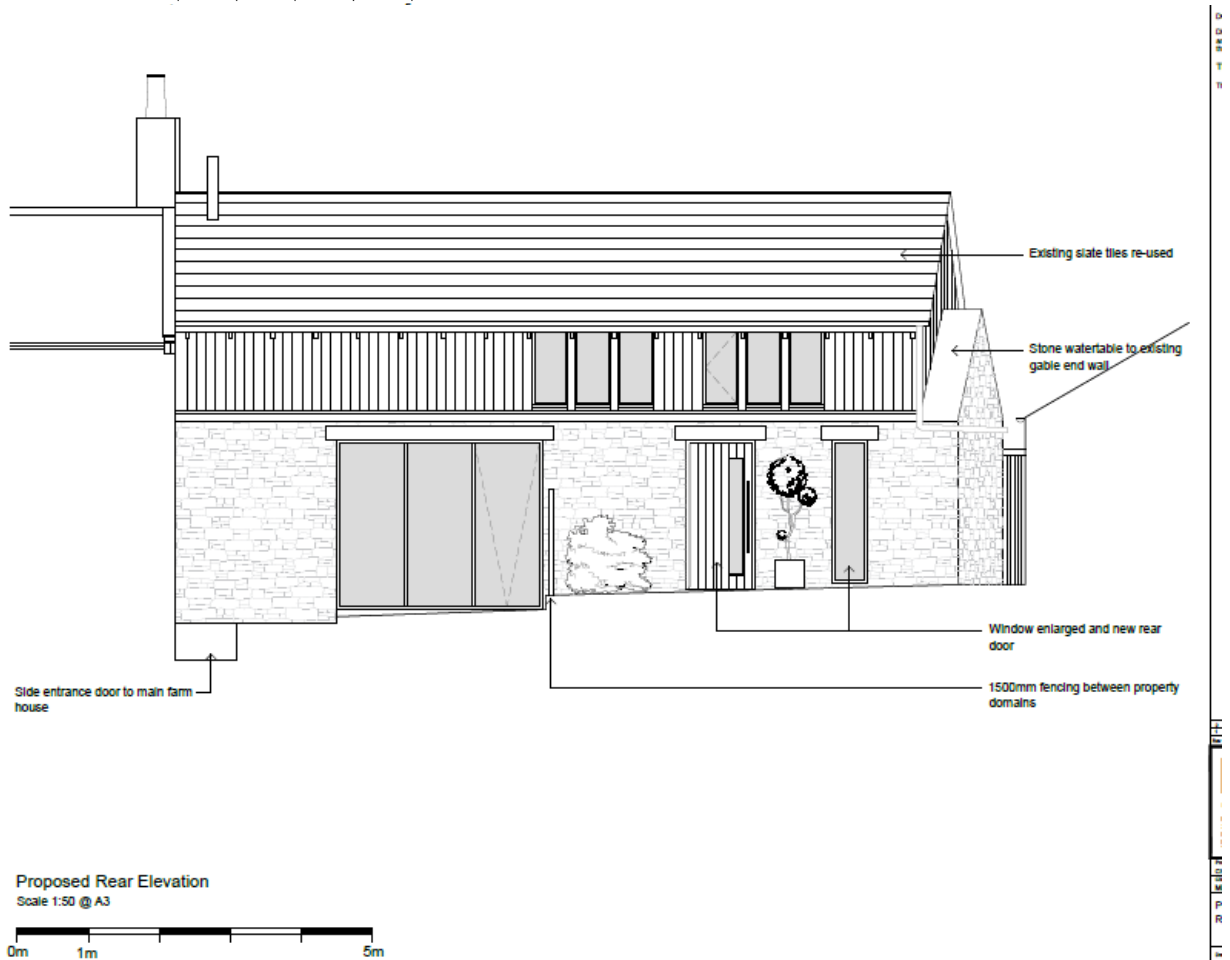
B.1 CURRENT DEVELOPMENT INFORMATION

The planning application is for conversion of a small barn. Development proposals are likely to involve:

- Re-structuring/re-pointing of existing stonework
- Raising the existing wall height
- Removal of roof and replacement
- Removal of roof timbers
- Exposing of the wall tops via roof stripping works



Proposed Front Elevation
Scale 1:50 @ A3



Proposed Rear Elevation
Scale 1:50 @ A3

FIGURE 3: DEVELOPMENT PROPOSALS

C. METHODOLOGY

C.1 SCOPE OF STUDY

The scope of the study, in terms of the survey area and the desk study area, is based on professional judgement. The scope has been determined based on the site's characteristics, the nature of the surrounding area, the development proposed at the time of reporting and the likely associated zone of influence.

For this site the survey area comprised the green line boundary as defined within the figure in section B with, in addition, a 50m buffer around the periphery appraised where access was available. The survey area included all potential roost sites within and adjacent to the survey area, which may be affected by the proposed development.

The desk study included an assessment of land-use in the surrounding area and a data search covering a 2km buffer zone (see below for further detail).

The level of survey effort employed at the site has taken account of the recommendations within the Bat Conservation Trust Good Practice Survey Guidelines².

C.2 DESK STUDY

Initially, the site was assessed from aerial photographs and 1:25,000 Ordnance Survey maps. In addition, any relevant SSSI IRZ that indicates development proposal could potentially have adverse impacts on protected sites.

C.3 PRELIMINARY FIELD STUDY METHODOLOGY

C.3.1 PRELIMINARY ASSESSMENT

The potential suitability of the habitats within the survey area in relation to commuting and foraging bats was classified as negligible, low, moderate or high, based on guidelines provided by the Bat Conservation Trust³ and detailed within the table below.

TABLE 1: GUIDELINES FOR ASSESSING THE POTENTIAL SUITABILITY OF PROPOSED DEVELOPMENT SITES FOR BATS, BASED ON PRESENCE OF HABITAT FEATURES WITHIN THE LANDSCAPE. <i>(TO BE APPLIED USING PROFESSIONAL JUDGEMENT, TABLE 4.1 BAT SURVEY GUIDELINES)</i>	
Suitability	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.

² Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

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

High	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland tree lined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>
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C.3.2 DAYTIME BAT RISK ASSESSMENT (STRUCTURES)

A daytime assessment was made of all structures affected by the proposed development, in order to evaluate their potential for supporting bat roosts, and, where present, to record signs of use by bats.

Structures were inspected both externally and internally where access was available. Binoculars and extendable ladders were used to assist with the inspection for droppings and other field signs.

Where present, soffits, purlins and ridge boards were searched thoroughly, together with the walls and floor under potential roost sites and any mortise joints, particularly in the gable walls. Wherever practicable, roof spaces and attic areas were surveyed for signs of droppings, which persist all year in dry conditions, food debris, entry points and bats themselves. Where bats were present the survey was adapted to avoid disturbance, with identification being confirmed either by recording bats at emergence and analysing the calls or through undertaking DNA analysis of droppings.

Externally, the building was examined for potential roost access points indicated by clean crevices, urine marks, polished wood or stonework and droppings. Particular attention was given to sheltered areas under the eaves of buildings, window ledges and towards the tops of windows where droppings are less likely to have been washed off.

Structures were categorised as having negligible, low, moderate or high suitability to be used by roosting bats, based on guidelines provided by the Bat Conservation Trust⁴ and detailed within the table below.

TABLE 2: GUIDELINES FOR ASSESSING THE POTENTIAL SUITABILITY OF PROPOSED DEVELOPMENT SITES FOR BATS, BASED ON PRESENCE OF ROOSTING HABITAT FEATURES (STRUCTURES) <i>(TO BE APPLIED USING PROFESSIONAL JUDGEMENT, TABLE 4.1 BAT SURVEY GUIDELINES)</i>	
Suitability	Roosting Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure with one or more potential roost site that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

⁴ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

Note that comments on the state of the structures within the site relate solely to their potential use by bats and must not be taken as a professional assessment of the structural integrity or safety of the structures. For example, descriptions of walls and roofs being in ‘good’ or ‘poor condition’ relate to likely provision of roost sites for bats, potential access routes to roost sites, and likely persistence of field signs such as droppings and feeding remains, which will not persist in exposed conditions. Maternity roosts are less likely to be present in cool, exposed, damp and draughty locations which may develop in a building in poor condition.

C.3.3 PRELIMINARY SURVEY - EQUIPMENT

- High powered torch.
- Good quality binoculars.
- Digital camera.

C.3.4 PRELIMINARY SURVEY – DATES & ENVIRONMENTAL CONDITIONS

DATE	TEMPERATURE °C	CLOUD COVER %	PRECIPITATION	WIND CONDITIONS
27.10.20	8	70	Dry	Still

C.3.5 DUSK EMERGENCE/DAWN SWARMING PRESENCE/ABSENCE SURVEY

C.3.5.1 SURVEY EFFORT

The level of survey effort employed has taken account of the guidance provided by the Bat Conservation Trust (BCT)⁵ and summarised within the table below.

	Low Roost Suitability*	Moderate Roost Suitability	High Roost Suitability
Recommended minimum number of survey visits for presence/absence survey to give confidence in a negative result	One survey visit. One dusk emergence or dawn re-entry survey (structures). For trees with low roost suitability, no further surveys required.	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey.	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.
Recommended timings for presence/absence surveys	May to August	May to September with at least one of the surveys between May and August	May to September with at least two of the surveys between May and August
* If a structure is classified as having low suitability for bats an ecologist should make a professional judgement on how to proceed based on all of the evidence available. If sufficient areas of a structure have been inspected and no evidence found (and is unlikely to have been removed by weather or cleaning or be hidden), then further surveys may not be appropriate.			
Note: Where a roost is confirmed as being present, further surveys may be required to fully characterise the roost			

The recommendations provided above are guidelines and it is recognised by BCT that ‘the number of visits could be adjusted (up or down) if necessary by the ecologist, bearing in mind the site-specific circumstances’.

⁵ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

Details of dates, timings, weather, and surveyor numbers and names are provided in the results section.

C.3.5.2 SURVEY METHODS

Activity surveys were undertaken in suitably mild conditions when bats are active. Surveyor locations sought to box-in the site and give a good degree of confidence as to whether bats were flying into or out of the survey area.

Light levels were recorded at 5 minute intervals, using a light meter, located in an open area and directed upwards to ensure a standard baseline. Light levels generally provide a more reliable indicator of the likely times for bat emergence than minutes past sunset and this approach is recommended by BCT⁶. There is significant variation in emergence times, but hundreds of surveys by E3 in northern England over recent years have indicated that pipistrelles are likely to start emerging around 70 lux, noctule at a similar level or earlier, *Myotis* bats generally start to emerge below 10 lux, with most *Myotis* activity and brown long-eared emergence below 2lux. Bats are rarely recorded above 150 lux, and as light levels go below 0.5 lux bat activity in the vicinity of the roosts tends to decrease as bats disperse across the wider countryside. Bat emergence will start at higher light levels when there is good cover close to the roost. For example *Myotis* bats have been recorded emerging in light conditions above 50 lux when there is a short flight line from the roost site to dense woodland. If a species is recorded when light levels are close to expected emergence light levels, then the likelihood that a roost is nearby is greatly increased.

Surveyors were positioned to ensure coverage of all high-risk areas of the site, including any potential flight-lines from structures within the site to adjacent cover such as woodland blocks. If bats were recorded within the site before bats were seen in the wider area, or seen flying into the site, it is assumed that roosts are present within the site.

All surveyors used both Batbox Duet bat detectors to listen for bats and Anabat Express detectors, at each surveyor location, to record and better identify bat species. Listening through earphones to both heterodyne and frequency division signals helps ensure that all bat species were detected⁷, whilst recording all bat activity using the Express removes the risk of surveyor error in timings and species ID.

Timings for observations of key bat activity such as emergence, first records of each species and commuting routes were recorded using radio-wave synchronised clocks. All data were recorded using the Anabat Express for future reference and to allow confirmation of species identification through call analysis (using Analook software), and to capture brief echolocation calls that could not be reliably identified in the field⁸. Field survey recorded numbers of bats detected, feeding activity, flight paths, species (as far as is practicable), and social calls.

A total of 4 person-nights work was undertaken.

⁶ http://www.bats.org.uk/pages/recording_light_level_data.html

⁷ Listening to frequency division calls as well as heterodyne significantly increases the detection rate of *Nyctalus* species

⁸ Reviewing data recorded by surveyors using Duet detectors and the Anabat data indicated that reliable *Myotis* records increased through Anabat use, particularly once conditions were too dark for visual cues to assist in identification, when there was a lot of bat activity, and with bats in clutter. It also reduces errors where pipistrelles in clutter can be mis-identified as *Myotis* bats.

C.3.5.3 SURVEY EQUIPMENT

- Duet bat detectors
- Anabat Expresses
- Light meter

C.3.6 DATA ANALYSIS

All bat calls were analysed using Analook with calls identified to species where possible, referencing call parameters as detailed within Russ (2012)⁹ and Middleton et al (2014)¹⁰.

Species from the *Myotis* genus of bats produce frequency modulated calls with overlapping call parameters and cannot be reliably distinguished to species level on call alone. As such, within this report, *Myotis* calls are identified as '*Myotis ?species*', with the most likely species identified through an assessment of a combination of call slope, loudness, frequency range, habitat and, where the bat was observed in flight, flight characteristics. Where insufficient information is available, calls are simply identified as '*Myotis sp.*'

Bats from the pipistrelle genus also produce calls with overlapping parameters and the call criteria used to differentiate between species of this genus, based on peak frequencies, are detailed within the table below.

Species	Call Peak Frequency Range (KHz)
Common pipistrelle	>42 and <49
Soprano pipistrelle	≥51
Nathusius' pipistrelle	<40
Common or soprano pipistrelle ('50KHz pip')	≥49 and <51
Common or Nathusius' pipistrelle ('40KHz pip')	≥40 and ≤42

Similarly, bats of the *Nyctalus* genus produce calls with overlapping call parameters. Where calls are obtained in an open environment, the two *Nyctalus* species found in this region can be differentiated and calls will be identified as noctule or Leisler's bat. Where there is doubt, calls are noted as *Nyctalus sp.*

Within this report, for all species, if the species name is given without qualification, the record was of good quality and fell within recognised parameters with no potential overlap with other species present in the region. If there is a degree of uncertainty this is indicated by a question mark, e.g. ?brown long-eared. If identification to species is not practicable, then where possible calls are identified to genus.

C.4 PERSONNEL

The table below details the personnel who undertook the key survey work.

Name	Position	Professional Qualifications	Natural England Survey Licence Numbers
Mary Martin	Director	BSc MCIEEM	2015-12822-CLS-CLS
Joanne Appleby	Lead Surveyor	-	-
Lizzie Ross	Lead Surveyor	BSc MSc	2015 11464 CLS CLS

⁹ Russ, J. (2012) British Bat Calls: A Guide to Species Identification. Pelagic Publishing

¹⁰ Middleton, N., Froud, A. and French, K. (2014) Social Calls of the Bats of Britain and Ireland. Pelagic Publishing

Further details of experience and qualifications are available at www.e3ecology.co.uk.

C.5 ASSESSMENT METHODOLOGY

The relative value of the ecological receptors (habitats, species and designated sites) was assessed using a geographical frame of reference. For designated sites this is generally a straightforward process with the assigned designation generally being indicative of a particular value, e.g. Sites of Special Scientific Interest are designated under national legislation and are therefore generally considered to be receptors of national value. The assignment of value to non-designated receptors is less straightforward and as recognised by the Guidelines for Ecological Impact Assessment produced by the Chartered Institute of Ecology and Environmental Management¹¹, is a complex and subjective process and requires the application of professional judgement.

When assessing the value of species and habitats, relevant documents and legislation are considered including the lists of species and habitat of principal importance annexed to the NERC Act (2006) and those provided within relevant local Biodiversity Action Plans. Data provided through consultation is also considered. These data sources can provide context at a local, regional and national scale.

The table below provides examples of receptors of value at different geographical scales.

Level of Value	Examples
International	An internationally designated site or candidate site.
	A site meeting criteria for international designation.
	The site is of functional importance* to a species population with internationally important numbers (i.e. >1% of the biogeographic population)
National	A nationally designated site.
	The site is of functional importance* to a species population with nationally important numbers (i.e. >1% of the national population)
Regional	The site is of functional importance* to a species population with regionally important numbers (i.e. >1% of the regional population)
County	A Local Wildlife Site (LWS) or equivalent, designated at a County level
	The site is of functional importance* to a species population of county value (i.e. >1% of the county population)
District	A Local Wildlife Site (LWS) or equivalent, designated at a District level
	The site is of functional importance* to a species population of district value (i.e. >1% of the district population)
Parish	A species population considered to appreciably enrich the nature conservation resource within the context of the parish.
	Local Nature Reserves
Local	A species population that contributes to local biodiversity but are not exceptional in the context of the parish.
Low	Habitats that are unexceptional and common to the local area.

** Functional importance defined as 'a feature which, based on professional judgement, is of importance to the day to day functioning of the population, the loss of which would have a detectable adverse effect on that population'.*

11 Chartered Institute for Ecology and Environmental Management (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater and Coastal

D. RESULTS

D.1 DESKTOP STUDY

D.1.1 PRE-EXISTING INFORMATION

ORDNANCE SURVEY MAPPING AND AERIAL PHOTOGRAPHY

The most recent aerial photograph of the site (2019) indicates that habitats on site are dominated by the building and garden. Historic imagery suggests that this has remained unchanged since at least 2002.

MAGIC WEBSITE¹²

There are no internationally and nationally statutorily designated sites for bats within 2km. The site does not lie within a SSSI IRZ which is of relevance to this development.

PREVIOUS SURVEY WORK BY E3 ECOLOGY

E3 have recorded common and soprano pipistrelle and *Myotis* sp. bats in Acomb.

D.2 DAYTIME RISK ASSESSMENT

D.2.1 HABITATS

FORAGING HABITATS & COMMUTING ROUTES

Foraging within the immediate area is limited to gardens and street trees, but within the wider area there is woodland and pasture land providing foraging areas. Gardens provide commuting routes to this wider habitat.



SHELTERED FLIGHT AREAS

The building is open therefore provides a small area of foul weather foraging and the garden will provide some shelter from winds.



¹² MAGIC Website: www.magic.gov.uk

ALTERNATIVE ROOST LOCATIONS

There are numerous alternative roosting opportunities associated with the village, including stone houses immediately adjacent.



D.2.2 BUILDINGS

The following text provides building descriptions. Where recorded, field signs that confirm bat use are in bold.

- Single storey.
- Random stone construction. Pointing on the southern elevation in good condition, with only a very small number of holes noted; to the north, pointing is in much poorer condition with numerous gaps in the walls and around lintels. Daylight could be seen through some of these cracks making them draughty and exposed, but there were some that provided access to suitable crevices.
- Unlined pitched slate roof in moderately poor condition, dipped in the centre, with some slipped or missing slates at the eaves.
- Ridge tiles have central vented ridges providing potential access, with potential roosting opportunities between the ridge tiles and ridge board.
- Large open access with quadruple timber lintels, with gaps between these that provide potential access to the stonework. Some crevices associated with the northern window and door lintels.
- Internally a single space open to the void.
- The majority of the walls and visible wall tops internally are moderately well sealed, but cracks are present on the western gable.
- No field signs.
- Evidence of nesting birds.
- Low-moderate suitability.





D.2.3 TREES

No trees will be affected by the proposals.

D.3 OVERVIEW OF SITE SUITABILITY

HABITATS AND SETTING ¹³				
	NEGLIGIBLE	LOW	MODERATE	HIGH
HABITATS AND COVER WITHIN 200M	City Centre	Open, exposed arable, amenity grass or pasture	Hedges and trees linking site to wider countryside	Excellent cover with mature trees and/or good hedges
HABITATS WITHIN 1KM	City Centre	Little tree cover, few hedges, arable dominated	Semi-natural habitats e.g. trees, hedgerows	Good network of woods, wetland and hedges

¹³ Building and habitat risk assessment technique audited in a research project with York University which compared the risk assessment scoring with the results of detailed field assessment for over 100 sites. Statistically significant associations were found between habitat setting and building features and the presence of absence of different bat species. For example habitat connections and nearby woodland were significant for brown long-eared bats and the presence of species-rich grassland is important for many species.

TABLE 8: OVERVIEW OF SITE SUITABILITY FOR BATS				
ALTERNATIVE ROOSTS WITHIN 1KM	City centre	Numerous alternative roost sites of a similar nature	A number of similar buildings in the local area	Few alternative buildings and site of good quality for roosts
SETTING	Inner city	Urban with little green space	Built development with green-space, wetland, trees	Rural Lowland with woodland and trees.
DISTANCE TO WATER/ MARSH	>1km	500m-1000m	200m-500m	<200m
DISTANCE TO WOODLAND/ SCRUB	>1km	500m-1000m	200m-500m	<200m
DISTANCE TO SPECIES-RICH GRASSLAND	>1km	500m-1000m	200m-500m	<200m
COMMUTING ROUTES	Isolated by development, major roads, large scale agriculture	No potential flyways linking site to wider countryside	Some potential commuting routes to and from site	Site is well connected to surrounding area with multiple flyways
BUILDINGS ²				
	NEGLECTIBLE	LOW	MODERATE	HIGH
AGE (APPROX.)	Modern	Post 1940's	1900-1940	Pre 20 th C
BUILDING/ COMPLEX TYPE	Industrial complex of modern design	Single, small building	Several buildings, large old single structure	Traditional farm buildings, country house, hospital
BUILDING - STOREYS	N/A	Single storey	Multiple storeys	Multiple storeys with large roof voids
STONE/BRICK WORK	No detectable crevices	Well pointed	Some cracks and crevices	Poor condition, many crevices, thick walls
FRAMEWORK – TIMBERS/STEEL	Modern metal frame with sheet cladding	Timber purlins, sheet asbestos	Timbers kingpost or similar	Large timbers traditional joints
ROOF VOID	Fully sealed or flat roof	Small, cluttered void	Medium, relatively open	Large, open, interconnected
ROOF COVERING	Modern sheet materials and tightly sealed	Good condition or very open not weatherproof modern sheet materials	Some potential access routes, slates, tiles	Uneven with gaps, not too open, stone slates
ADDITIONAL FEATURES	Very well maintained and tightly sealed	No features with potential access	Some features with potential access	Hanging tiles, cladding, barge boards, soffits with access gaps
EXTERNAL LIGHTING	Extensive security lights covering much of the site	Widespread areas above 2 lux at night	Intermittent lights of low intensity	Minimal
BUILDING USE	Very noisy, dusty	Regular use	Intermittent use	Disused

Overall, the building is considered of low-moderate suitability but due to its small size and unlined roof, likely to be used by no more than a small numbers of bats.

D.4 PRESENCE/ABSENCE SURVEY

10th May 2021

The survey was undertaken on a mild night (14 °C at start dropping to 9 °C by end), with some rain for 5 minutes at the start of the survey and a brief spell of rain during the survey, although bat activity was recorded during this time. Activity was generally fairly low, with the first bat (a noctule) recorded at 21.35 (~2.9 lux) flying over the adjacent housing, with an individual

Myotis and occasional common pipistrelle and noctule passes later in the survey. No definite roosts were recorded.

25th May 2021

The survey was undertaken in temperatures between 8 and 10°C. This is consistent with temperatures over the preceding weeks and did not appear to deter bat activity. The wind conditions were light with occasional light gusts. Activity levels were intermittent and predominantly attributed to a small number of commuting common pipistrelle bats. The surveyor to the southeast of the building also recorded a single overflying noctule pass. Commuting pipistrelles used a range of flightlines to pass through the site with no particular route considered dominant or able to indicate likely nearby roosts. No bat flightlines were close to the building elevations or roof line. No roosts were detected and there was no queried/potential re-entry locations.

A torchlight inspection of the interior of the building and roof timbers did not record roosting bats.

An electronic device, plugged into a wall socket, produced a pulse every 5 seconds which could be detected by the Duet recorder. This was considered likely to be a rodent deterrent but may also be audible to bat species.

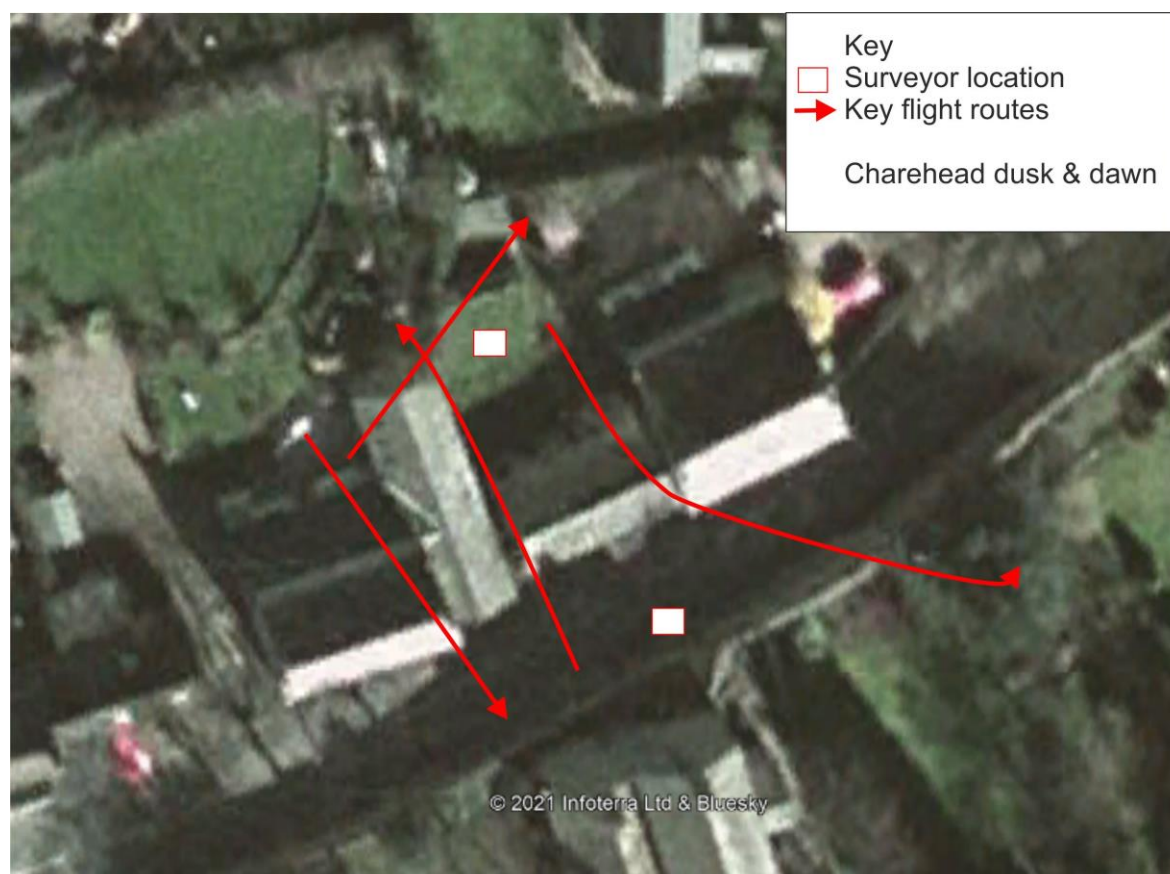


FIGURE 4: SUMMARY OF PRESENCE/ABSENCE SURVEYS

D.5 ADDITIONAL SPECIES GROUPS

Evidence of a jackdaw nest was recorded on an internal wall top, and a further nest was visible within a gap created by a missing stone externally during the October inspection.



E. SITE ASSESSMENT

E.1 ASSESSMENT OF SURVEY FINDINGS

The building is considered of low to moderate suitability for use by a small number of bats but no roosts were identified during the surveys.

The site is likely to be of no more than local value to nesting birds.

E.2 LIMITATIONS AND CONSTRAINTS

There was a brief period of rain (~5 minutes) at the start of the dusk survey, and again part way through (~10 mins) but this is not considered to have impacted on the assessment, with bats active during the second period of rain.

F. IMPACT ASSESSMENT

Impacts include:

- The loss of a small number of potential crevice roost sites.
- Disturbance or harm to a small number of bats that may be using the building at the time of proposed works, potentially including hibernating bats if works are undertaken during the winter.
- Increased lighting and disturbance around the site.
- Harm/disturbance to nesting birds.

G. RECOMMENDATIONS

G.1 FURTHER SURVEY

If development does not happen within 12 months of the last survey, an updating survey will be required, ideally to be undertaken between May and August.

G.2 AVOIDANCE AND MITIGATION STRATEGY

G.2.1 SITE DESIGN

- External lighting that may reduce bat use of potential roost sites will be avoided. High intensity security lights will be avoided as far as practical. Light spillage to areas used by foraging or commuting bats should be less than 2 lux. Where security lights are required, these will be of minimum practicable brightness, be set on a short timer and will be motion sensitive only to larger objects.

G.2.2 TIMING OF WORKS

- A bat box (as detailed below) will be provided on site prior to works commencing to provide roosting opportunities during the works.
- The following key elements of work will not be completed during the hibernation period (November to end Feb inclusive):
 - Demolition of stonework
 - Re-structuring/re-pointing of existing stonework
 - Keying in of new build to existing stonework
 - Removal of ridge tiles and slates
 - Removal of roof timbers
 - Exposing of the wall tops via roof stripping works
- A check for nesting birds will be undertaken by a suitably experienced ornithologist if building conversion works commence between March and August inclusive.

G.2.3 WORKING METHODS AND BEST PRACTICE

- A precautionary bat method statement will be provided to contractors at the start of works.
- Old slates and ridge tiles will be removed carefully by hand, being aware that bats may be present beneath slates or ridge tiles, within mortise joints, cavity walls, between loose stones, between lintels and in gaps around window frames.
- If bats are found during works, works will stop in that area and the ecological consultant will be contacted immediately. If it is necessary to move the bats for their safety, this will be undertaken by a licensed bat handler.

The following measures should be included as general good working practice:

- Timber treatments that are toxic to mammals will be avoided. If required, timber treatment will be carried out in the spring or autumn. Both pre-treated timbers and timber treatments will use chemicals classed as safe for use where bats may be present (see http://www.jncc.gov.uk/pdf/batwork_manualpt4.pdf).

G.3 COMPENSATION STRATEGY

The following compensation strategy is proposed:

G.3.1.1 *BAT BOXES*

In advance of the start of works one bat box will be erected in an adjacent tree, within the site owner's landholding, to provide alternative roost sites. Boxes will be erected as high as possible, ideally at a minimum height of 4m.

G.3.1.2 *CREVICE ROOST SITES*

A total of 4 crevice roosting opportunities will be provided within the completed development, either in the form of gaps under ridge tiles or built in bat boxes.

Traditional type 1F bitumastic roofing felt or eaves felt will be used in all areas where bats may come into contact with the sarking. It will be used to line the ridge of the open area of roof, and access slates will be located to connect with gaps in the felt whilst minimising the risk of water ingress. Insulation will be provided between the loft void and living areas below.

G.4 MONITORING

No monitoring required.

G.5 ADDITIONAL ENHANCEMENT RECOMMENDATIONS

The following additional enhancement measures are recommended in order to further enhance the site for biodiversity:

- A minimum of 2 bird boxes will be provided within the site.

APPENDIX 1. LEGISLATION

NATIONAL PLANNING POLICY

The table below details the key paragraphs from the National Planning Policy Framework (NPPF)¹⁴ relating to the natural environment:

TABLE 9: NATIONAL PLANNING POLICY FRAMEWORK: CONSERVING AND ENHANCING THE NATURAL ENVIRONMENT	
Statement	Paragraph
<p>Planning policies and decisions should contribute to and enhance the natural and local environment by:</p> <ul style="list-style-type: none"> a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate; d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate. 	170
Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework ¹⁵ ; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.	171
<p>Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads¹⁶. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development¹⁷ other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:</p> <ul style="list-style-type: none"> a) the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy; b) the cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and c) any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated. 	172
Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.	173
To protect and enhance biodiversity and geodiversity, plans should:	174

¹⁴ National Planning Policy Framework (February 2019), Department for Communities and Local Government,

¹⁵ Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.

¹⁶ English National Parks and the Broads: UK Government Vision and Circular 2010 provides further guidance and information about their statutory purposes, management and other matters.

¹⁷ For the purposes of paragraphs 172 and 173, whether a proposal is 'major development' is a matter for the decision maker, taking into account its nature, scale and setting, and whether it could have a significant adverse impact on the purposes for which the area has been designated or defined.

TABLE 9: NATIONAL PLANNING POLICY FRAMEWORK: CONSERVING AND ENHANCING THE NATURAL ENVIRONMENT	
Statement	Paragraph
<p>a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity¹⁸; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation¹⁹; and</p> <p>b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.</p>	
<p>When determining planning applications, local planning authorities should apply the following principles:</p> <p>a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;</p> <p>b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;</p> <p>c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons²⁰ and a suitable compensation strategy exists; and</p> <p>d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.</p>	175
<p>The following should be given the same protection as habitats sites:</p> <p>a) potential Special Protection Areas and possible Special Areas of Conservation;</p> <p>b) listed or proposed Ramsar sites²¹; and</p> <p>c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.</p>	176
<p>The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.</p>	177

Section 40 of the Natural Environment and Rural Communities Act 2006, places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity.

Planning Practice Guidance²² states:

- Planning authorities need to consider the potential impacts of development on protected and priority species, and the scope to avoid or mitigate any impacts when considering site allocations or planning applications. (para. 016)

¹⁸ Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

¹⁹ Where areas that are part of the Nature Recovery Network are identified in plans, it may be appropriate to specify the types of development that may be suitable within them.

²⁰ For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.

²¹ Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site.

²² Planning Practice Guidance: Natural Environment (www.planningguidance.communities.gov) Updated July 2019

- Information on biodiversity and geodiversity impacts and opportunities needs to inform all stages of development (including site selection and design, pre-application consultation and the application itself). An ecological survey will be necessary in advance of a planning application if the type and location of development could have a significant impact on biodiversity and existing information is lacking or inadequate. (para. 018)
- Even where an Environmental Impact Assessment is not needed, it might still be appropriate to undertake an ecological survey, for example, where protected species may be present or where biodiverse habitats may be lost. (para. 018)
- As with other supporting information, local planning authorities should require ecological surveys only where clearly justified. Assessments should be proportionate to the nature and scale of development proposed and the likely impact on biodiversity. (para. 018)
- The National Planning Policy Framework encourages net gains for biodiversity to be sought through planning policies and decisions. Biodiversity net gain delivers measurable improvements for biodiversity by creating or enhancing habitats in association with development. Biodiversity net gain can be achieved on-site, off-site or through a combination of on-site and off-site measures. (para. 022)

RELEVANT LEGISLATION

Within England all bat species are specially protected under the Conservation of Habitats and Species Regulations 2017 (as amended).

As a result there is a requirement to consult with Natural England before undertaking any works that may disturb bats or their roost, and under the Conservation of Habitats and Species Regulations it is illegal to.

- Deliberately kill, injure or capture bats.
- Deliberately obstruct access to a bat roost.
- Damage or destroy a bat roost.
- Deliberately disturb bats; in particular any disturbance which is likely to impair their ability:
 - (i) to survive, to breed or reproduce, or to rear or nurture their young; or
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - (iii) to affect significantly the local distribution or abundance of the species to which they belong.

Under the Wildlife and Countryside Act (1981) the above offence of disturbing bats includes low level disturbance and as such under this act it is also an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a roost.
- Intentionally or recklessly obstruct access to a roost.

Under the above legal protection, only the offences under the Conservation of Habitats and Species Regulations 2017 (as amended) are strict liability offences; the remaining offences, under the Wildlife and Countryside Act (1981), are offences only where they are carried out "intentionally or recklessly".

Under the Countryside and Rights of Way Act 2000 (CROW Act) the offence in section 9(4) of the Wildlife and Countryside Act 1981 of disturbing bats is extended to cover reckless damage or disturbance.

The Hedgerow Regulations 1997 provide for the conservation of important hedgerows and their constituent trees. The presence of a protected species such as bats is a relevant consideration when assessing whether a hedgerow is important and may influence a local planning authority's decision on whether to approve removal of such hedges.

PRIORITY SPECIES

Although not afforded any legal protection, national priority species (species of principal importance, as listed in Section 41 of the NERC Act (2006)), and local and regional priority species, as detailed within the relevant biodiversity action plans, are material considerations in the planning process and as such have been assessed accordingly within this report.

The following bat species are listed as national priority species: Barbastelle bat, Bechstein's bat, noctule, soprano pipistrelle, brown long-eared bat, greater horseshoe bat and lesser horseshoe bat. 'Bats' as a species group is also listed on the relevant local biodiversity action plan for this site.

APPENDIX 2. BAT ECOLOGY

BAT LIFECYCLE

Bat survey timings are based on the lifecycle of bats which varies through the calendar year. The table below illustrates recommended survey timings and how they relate to the bat lifecycle:

BAT LIFECYCLE AS IT RELATES TO SURVEY TIMING ²³												
SURVEY TYPE	J	F	M	A	M	J	J	A	S	O	N	D
Roost Inspection	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey
Mating/Swarming Survey							Light grey	Dark grey	Dark grey	Dark grey	Light grey	Light grey
Hibernation Survey	Dark grey	Dark grey	Dark grey	Light grey	Light grey							Dark grey
Tree survey from the ground	Dark grey	Dark grey	Dark grey	Dark grey	Light grey	Light grey	Light grey	Light grey	Light grey	Light grey	Light grey	Light grey
Tree roost activity survey				Light grey	Light grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Light grey	Light grey
Building roost activity survey						Dark grey	Dark grey	Dark grey	Dark grey	Light grey	Light grey	Light grey
Dark grey are optimal timings, light grey suboptimal.												
BAT ROOST USE THROUGH THE YEAR												
Day Roost				Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey
Night Roost	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey
Feeding Roost				Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey	Dark grey
Transitional/Occasional Roost			Dark grey	Dark grey	Dark grey					Dark grey	Dark grey	Dark grey
Swarming Site								Dark grey	Dark grey	Dark grey	Dark grey	
Mating Site								Dark grey	Dark grey	Dark grey	Dark grey	
Maternity Roost					Dark grey	Dark grey	Dark grey	Dark grey	Dark grey			
Hibernation Roost	Dark grey	Dark grey	Dark grey	Dark grey							Dark grey	Dark grey
Satellite Roost						Dark grey	Dark grey	Dark grey	Dark grey			

²³ Based on information provided within Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

BAT ROOST TYPES

Bat Roost Types	
Roost Type	Definition
Day Roost	A place where individual bats or small groups of males, rest or shelter in the day but are rarely found by night in the summer.
Night Roost	A place where bats rest or shelter in the night but are rarely found in the day. May be used by a single individual on occasion or could be used regularly by the whole colony.
Feeding Roost	A place where individual bats or a few individuals rest or feed during the night but are rarely present by day.
Transitional/Occasional Roost	Used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.
Swarming Site	Where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites.
Mating Site	Sites where mating takes place from late summer and can continue through winter.
Maternity Roost	Where female bats give birth and raise their young to independence. Females typically give birth to a single pup per year, therefore these roosts are critical to the long-term survival of a colony. Disturbance of maternity roosts can lead to abandonment and death of young.
Hibernation Roost	Where bats may be found individually or together during winter. They have a constant cool temperature and high humidity. Bats are particularly vulnerable to disturbance during the hibernation period as, once roused, they may be unable to replace energy lost due to a lack of sufficient available insect prey at this time.
Satellite Roost	An alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season.

SPECIES SPECIFIC ECOLOGY

Pipistrelle maternity colonies generally consist of 25 to 100 individuals, but colonies numbering up to 1000 are not uncommon²⁴. Adult females often form large maternity roosts, occupied between May and August, and frequently number around 300 individuals. Males are often solitary or in small groups during the summer, later congregating with the females at winter hibernation roosts²⁵.

Maternity colonies of brown long-eared bats are generally small, consisting of 10 to 20 adults^{26,27} (although numbers are likely to be underestimated, due to presence in inaccessible areas of the roost). In exceptional circumstances, colonies can reach 200+ bats.

Natterer's bats roost within crevices and cavities, typically within hollow trees, old buildings, caves and tunnels²⁸. Maternity colonies comprising up to 200 adult females can be found in buildings during the summer months while bachelor roosts comprising up to 28 males have been recorded during the summer months in Scotland²⁹. Maternity roosts are not exclusively female, with both adult and immature males comprising up to 25% of the colony. Male only colonies have been found with up to 30

²⁴ Roberts, G.M. & Hutson, A.M. 2000. *Pipistrelle*. British Bats No. 6. The Bat Conservation Trust, London

²⁵ Corbet, G.B & Southern, H.N., 1964. The handbook of British Mammals).

²⁶ Speakman, J. R. *et al.*, 1991. Minimum summer populations and densities of bats in NE Scotland, near the northern borders of their distributions. *J. Appl. Ecol.*, 225: 327-345

²⁷ Entwistle, A.C., 1994. Roost ecology of the brown long-eared bat *Plecotus auritus* in north-east Scotland. Unpublished PhD thesis, University of Aberdeen, UK

²⁸ Stebbings, R.E. 1991. Natterer's bat *Myotis nattereri*. In The handbook of British Mammals. 3rd Edition Corbet, G.B. & Harris, S. (Eds) Oxford: Blackwell Scientific.

²⁹ Swift, S. M. 1997 Roosting and foraging behaviour of Natterer's bats (*Myotis Nattereri*) close to the northern border of their distribution. *J. Zool. (Lond)* **242**: 375-384.

bats³⁰. Foraging individuals will perch during the night at roosts near to foraging areas, not used as day roosts. Mostly these roosts are trees or shrubs but barns will also be used³¹.

Whiskered bats roost in trees and buildings. Nursery roosts can number over 100 bats, and are almost exclusively female bats. This species hibernates singly in caves, hanging on the open wall or in crevices³⁰.

Brandt's bat is thought to have similar roosting behaviour and foraging ecology to the whiskered bat, however, further research is needed to clarify this³⁰.

A third small *Myotis* species, the Alcatloe's bat has recently been confirmed within the UK.

³⁰ Altringham, J.D. 2003. British Bats. The New Naturalist. Pub. Harper Collins.

³¹ Smith, P.G. & Racey, P.A. 2005. The itinerant Natterer: physical and thermal characteristics of summer roosts of *Myotis nattereri* (Mammalia: Chiroptera) J. Zool. Lond. 266: 171-180.

APPENDIX 3. BATS AND DEVELOPMENT

A summary of the likely scale of impact at a site level in relation to various bat features and development effects is provided below.

SUMMARY OF MAIN IMPACTS AT SITE LEVEL				
Habitat Feature	Development Effect	Scale of impact		
		Low	Medium	High
Maternity Roost	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside breeding season	✓		
	Post-development interference			✓
Major Hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference			✓
Minor Hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Modified management		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference		✓	
	Temporary destruction then reinstatement	✓		
Mating	Destruction		✓	
	Isolation caused by fragmentation		✓	
	Partial destruction; modification	✓		
	Modified management	✓		
	Temporary disturbance outside hibernation season	✓		
	Post-development interference	✓		
	Temporary destruction then reinstatement	✓		
Night Roost	Destruction	✓		
	Isolation caused by fragmentation	✓		
	Partial destruction; modification	✓		
	Modified management	✓		
	Temporary disturbance outside hibernation season	✓		
	Post-development interference	✓		
	Temporary destruction then reinstatement	✓		

N.B. This is a general guide only and does not take into account species differences. Medium impacts in particular depend on the care with which any mitigation is designed and implemented and could range between high and low.