BAT SURVEY
HARBOTTLE FISHING LODGE NORTHUMBERLAND

AUGUST
2020

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REPORT VERSION	STATUS	DATE	CHANGES	AUTHOR	PROOF READ	VERSION APPROVED BY
R01	Draft	13.7.20	1st draft	MEM	ZD	ADM
R02	Final	21.8.20	Final plans	MEM		

UNLESS REQUESTED OTHERWISE, THE INFORMATION BELOW, RELATING TO THE LOCAL AREA, WILL BE PROVIDED TO THE LOCAL ENVIRONMENTAL RECORDS CENTRE

SPECIES	RECORDER	DATE	LOCATION (4 FIG. NGR)	ABUNDANCE	COMMENT
monkeyflower	E3 Ecology	July 2020	NT 9304	Individual	Riverside, Harbottle
Soprano pipistrelle	E3 Ecology	July 2020	NT 9304	Day Roost & possible maternity roost	Harbottle
Myotis	E3 Ecology	July 2020	NT 9304	Day roost & foraging	Harbottle
Common pipistrelle	E3 Ecology	July 2020	NT 9304	foraging	Harbottle
Brown Long eared bats	E3 Ecology	July 2020	NT 9304	foraging	Harbottle
Noctule	E3 Ecology	July 2020	NT 9304	foraging	Harbottle

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A. SUMMARY

E3 Ecology Ltd was commissioned by Pauline Okane in June 2020 to undertake a daytime bat risk assessment and 2 dusk bat surveys of a small outbuilding on the edge of Harbottle.

It is proposed to convert the building to a fishing lodge, with a small extension added to the north. A track will be provided to the lodge over the adjacent field.

Consultation with the MAGIC website[1] indicated that there are no protected sites listed for bats within 2km. The site lies within woodland and parkland BAP habitat and within Northumberland National Park. It backs onto the River Coquet and Coquet Valley woodland Site of Special Scientific Interest (SSSI) with other SSSI's and Harbottle Woods SAC within 2km. It sits within the SSSI Impact Risk Zone (IRZ), the terms of which are relevant to this site (all planning applications) therefore Natural England may need to be consulted by the LPA.

The Bat Group have been consulted with data awaited.

Initial site inspection was undertaken on 2 July 2020 and comprised a detailed inspection of the structures and trees on site. Dusk activity surveys were undertaken on the 2nd and 16th of July 2020.

The site is situated in an area dominated by pasture and woodland with the River Coquet immediately to the north. Overall, the habitats present in the local area are of high suitability for use by foraging/commuting bats.

The building is a small single storey outbuilding, part with a pitched slate roof; the remaining roof is missing. Walls are of stone, with the section where the roof is missing having recently been reinforced with blockwork. Pointing is in relatively poor condition, externally, and moderate condition internally. The section with the remaining roof is open fronted and its roof is in poor condition and unlined. Overall, the building is considered to be of moderate suitability for use by roosting bats, but most likely by only small numbers of bats. It provides some suitable winter roosting opportunities for individual bats.

Thorough internal and external inspection of the buildings recorded no field signs but conditions are poor for their persistence.

Dusk emergence survey recorded the use of the building by small numbers of soprano pipistrelle and individual *Myotis* bats. Bat flight patterns also indicated a soprano pipistrelle roost, possibly maternity, within the village, with bats commuting down the woodland edge and across the site or along the river. Daubenton's bats were recorded foraging over the river, with low numbers of common pipistrelle foraging in trees and individual brown long eared bat and noctule passes.

The site is concluded to support the day roosts used by individual *Myotis* and small numbers of soprano pipistrelle and is considered to be of local conservation value.

Ground based assessment of the trees on site found that three trees close to the site had low-moderate roosting potential. These trees will be retained as part of the site design.

A monkey flower plant was recorded on the river edge just to the north east of the lodge, an introduced invasive species. Habitats immediately around the building are woodland with an

[1] MAGIC website: www.magic.gov.uk

understorey including foxglove *(*dominant immediately adjacent*),* red campion, herb robert, crosswort, chickweed*,* hogweed (*dominant),* dogs mercury*,* nettle and cleavers*,* with the more diverse species range recorded particularly as the bank starts to slope towards the river*.* Habitats immediately to the south and west were more coarse grassland or bare ground following the repair works to the walls. Beyond the fence to the west lies improved sheep grazed pasture.

Badger and red squirrel are likely to be present within the wider area though no evidence was recorded within 30m of the building. Otter will use the river, with potential lying up and feeding areas in the section of river adjacent to the building. Nesting birds will use the woodland, and the building provides some nesting opportunities for a small number of birds, though none were recorded during the surveys.

Potential impacts of the development in order of conservation significance are:

- Impacts on the adjacent SSSI during construction, through lighting and drainage/sewerage provision and through visitors accessing the river banks (though this is likely to be only a small number given the size of the structure).
- The loss of a small number of proven crevice roost sites and other potential crevice roosting opportunities.
- Disturbance or harm to a small number of bats that may be using the buildings at the time of proposed works, potentially including hibernating bats if works are undertaken during the winter.
- Increased levels of disturbance due to occupants of the properties, following on from the conversion.
- Increased lighting levels affecting foraging and commuting routes used by bats, and potential light spill onto the woodland and river corridor likely to be used by other protected species.
- Provision of an access track across the adjacent BAP habitat.
- Harm/disturbance to nesting birds should any tree/vegetation removal be undertaken during the bird nesting period (March-August).

Key mitigation measures are likely to include:

- Foul drainage from the building will flow to a package treatment plant to be sited to the south west of the building along with sustainable drainage measures for the surface water drainage.
- No materials will be stored within the SSSI woodland, or construction waste disposed of within the woodland or river corridor.
- Vehicular use of the adjacent BAP habitat will be minimised with any reinforced surfacing being of a design which will grass-over.
- A Natural England licence will be required for the re-roofing and conversion of the building, including precautionary working methods and the retention/re-creation of crevice roosting opportunities within the converted building and bat boxes in trees
- A sympathetic lighting regime with minimal (low level and low lux) and ideally no light spill on the river and woodland corridor.
- A checking survey for badger and otter within 3 months prior to works commencing to ensure no setts or lying up areas are present within 30m of the proposed works.
- Should vegetation removal be required between March and August inclusive, a checking survey should be undertaken by an experienced ornithologist to confirm active nests are absent.
- Habitat loss should be kept to the minimum required to provide a small sitting out area and parking by the lodge.

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 master-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

The purpose of this report is:

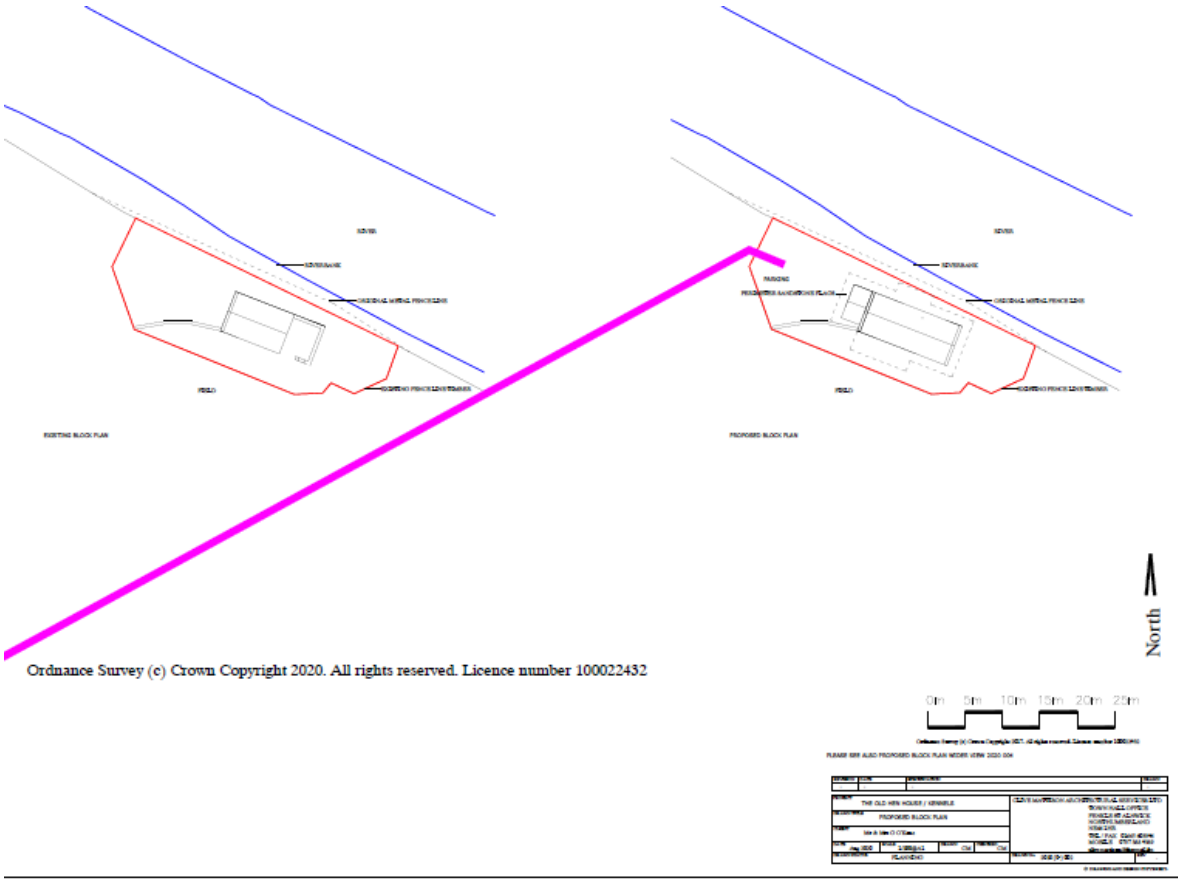
- To detail the results of the survey work of the buildings and trees on site that has been undertaken for bats.
- To provide recommendations to be incorporated into the design for the site.
- To provide recommendations for further survey work, where required.
- To set out the mitigation measures required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

The site is located to the east of Harbottle at an approximate central grid reference of NT 93890 04588.

B.1 CURRENT DEVELOPMENT INFORMATION

It is proposed to convert the existing building to a fishing lodge. Plans include:

- Construction of new small extension, tying into the existing building
- Re-structuring/re-pointing of existing stonework
- Removal of roofs and replacement
- Removal of roof timbers
- Exposing of the wall tops via roof stripping works
- Creation of an access track across the adjacent field



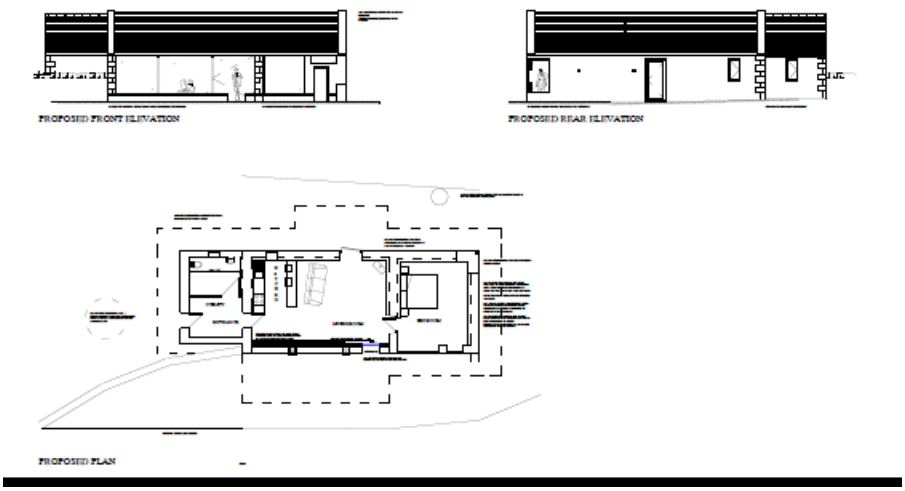


FIGURE 1 PROPOSED PLANS

C. PLANNING POLICY AND LEGISLATIVE CONTEXT

C.1 NATIONAL PLANNING POLICY

The table below details the key paragraphs from the National Planning Policy Framework (NPPF)[2] relating to the natural environment:

TABLE 1: NATIONAL PLANNING POLICY FRAMEWORK: CONSERVING AND ENHANCING THE NATURAL ENVIRONMENT	
Statement	**Paragraph**
Planning policies and decisions should contribute to and enhance the natural and local environment by: 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	*171*

[2] National Planning Policy Framework (February 2019), Department for Communities and Local Government,

TABLE 1: NATIONAL PLANNING POLICY FRAMEWORK: CONSERVING AND ENHANCING THE NATURAL ENVIRONMENT	
Statement	**Paragraph**
sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework[3]; 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.	
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 Broads[4]. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development[5] 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: 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: 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 biodiversity[6]; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation[7]; and 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.	*174*
When determining planning applications, local planning authorities should apply the following principles: 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; 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	*175*

[3] 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.
[4] 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.
[5] 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.
[6] Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.
[7] 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.

TABLE 1: NATIONAL PLANNING POLICY FRAMEWORK: CONSERVING AND ENHANCING THE NATURAL ENVIRONMENT	
Statement	**Paragraph**
the national network of Sites of Special Scientific Interest; 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 reasons[8] and a suitable compensation strategy exists; and 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.	
The following should be given the same protection as habitats sites: a) potential Special Protection Areas and possible Special Areas of Conservation; b) listed or proposed Ramsar sites[9]; and 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.	*176*
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.	*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 Guidance[10] 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)
- 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)

[8] 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.
[9] 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.
[10] Planning Practice Guidance: Natural Environment (www.planningguidance.communities.gov) Updated July 2019

C.2 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 at 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.

C.3 WILDLIFE SITE POLICY AND LEGISLATION

Details of the legislation surrounding protected sites are provided in the appendices.

C.4 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.

D. METHODOLOGY

D.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 below, 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 Guidelines[11].

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 2: SITE BOUNDARY

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

(Reproduced under licence from Google Earth Pro.)

FIGURE 3: SITE AND SETTING
(Reproduced under licence from Google Earth Pro.)

D.2 DESK STUDY

Initially, the site was assessed from aerial photographs and 1:25,000 Ordnance Survey maps. Following this, a data search was submitted to the local bat group in July 2020, requesting data relating to bats. In addition, a search was made of the MAGIC website[12] for any Natura 2000 sites within 10km, where the development may have the potential to lead to indirect disturbance of these sites, and any relevant SSSI IRZ that indicates development proposal could potentially have adverse impacts on protected sites.

D.3 PRELIMINARY FIELD STUDY METHODOLOGY

D.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 Trust[13] and detailed within the table below.

[12] Multi Agency Geographic Information for the Countryside (www.magic.gov.uk)
[13] Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

TABLE 2: GUIDELINES FOR ASSESSING THE POTENTIAL SUITABILITY OF PROPOSED DEVELOPMENT SITES FOR BATS, BASED ON PRESENCE OF HABITAT FEATURES WITHIN THE LANDSCAPE. *(TO BE APPLIED USING PROFESSIONAL JUDGEMENT, TABLE 4.1 BAT SURVEY GUIDELINES)*	
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.
High	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. 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. Site is close to and connected to known roosts.

D.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 were used to assist with the inspection for droppings and other field signs.

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 Trust[14] and detailed within the table below.

TABLE 3: GUIDELINES FOR ASSESSING THE POTENTIAL SUITABILITY OF PROPOSED DEVELOPMENT SITES FOR BATS, BASED ON PRESENCE OF ROOSTING HABITAT FEATURES (STRUCTURES) *(TO BE APPLIED USING PROFESSIONAL JUDGEMENT, TABLE 4.1 BAT SURVEY GUIDELINES)*	
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,

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

	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.

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.

D.3.3 DAYTIME GROUND BASED BAT RISK ASSESSMENT (TREES)

A preliminary assessment was made, from within the site boundaries, of any trees affected by the proposed development. Trees were inspected and assessed for their potential to support roosting bats and were categorised as negligible, low, moderate or high suitability for roosting bats based on guidelines provided within the Bat Conservation Trust Bat Survey: Good Practice Guidelines[15] and detailed within the table below.

TABLE 4: GUIDELINES FOR ASSESSING THE POTENTIAL SUITABILITY OF PROPOSED DEVELOPMENT SITES FOR BATS, BASED ON PRESENCE OF ROOSTING HABITAT FEATURES (TREES) *(TO BE APPLIED USING PROFESSIONAL JUDGEMENT, TABLE 4.1 BAT SURVEY GUIDELINES)*	
Suitability	**Roosting Habitats**
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A tree 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 tree 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.

The assessment is based upon the age and species of the tree, the presence of features with potential to support roosting bats and the location of the tree and habitats present in the surrounding area. Any potential roosting locations and field signs that could indicate bat use, such as droppings, staining and scratch marks were noted.

D.3.4 PRELIMINARY SURVEY - EQUIPMENT

- High power LED torch.
- Opticron 8 x 32 binoculars
- Digital camera

D.3.5 PRELIMINARY SURVEY – DATES & ENVIRONMENTAL CONDITIONS

TABLE 5: DAYTIME SURVEY CONDITIONS				
DATE	**TEMPERATURE**	**CLOUD COVER**	**PRECIPITATION**	**WIND CONDITIONS**
2.7.20	14.5ºC	30%	Dry	F1

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

D.4 DETAILED SURVEY METHODOLOGY

D.4.1 DUSK EMERGENCE/DAWN SWARMING ACTIVITY SURVEY

D.4.1.1 *SURVEY EFFORT*

The level of survey effort employed has taken account of the guidance provided by the Bat Conservation Trust (BCT)[16] and summarised within the table below.

TABLE 6: RECOMMENDED NUMBER AND TIMING OF PRESENCE/ABSENCE SURVEY VISITS REQUIRED TO PROVIDE CONFIDENCE IN NEGATIVE PRELIMINARY ROOST ASSESSMENT RESULTS (FROM TABLE 7.1 AND TABLE 7.3 BCT GUIDELINES)

	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*'.

A roost was proven during the first survey; a second dusk survey was considered the best approach for characterisation of the roost.

Activity surveys were undertaken on the dates in the table below. Details of timings, and surveyor numbers and names are provided in the appendices.

TABLE 7: ACTIVITY SURVEY

DATE	DUSK OR DAWN
2.7.20	Dusk
16.7.20	Dusk

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

D.4.1.2 *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 BCT[17]. 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 detected[18], 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 field[19]. Field survey recorded numbers of bats detected, feeding activity, flight paths, species (as far as is practicable), and social calls.

Remote monitoring was undertaken with Anabat Express detectors. This technique helps to record both emerging or flying bats and their echolocation calls without any disturbance from the presence of people. By cross-referencing times and external light levels, the likelihood of recorded bats roosting within the structures can be assessed.

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[17] http://www.bats.org.uk/pages/recording_light_level_data.html

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

[19] 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.

A total of 4 person-nights work was undertaken and direct observation was reinforced by remote recording of bat activity adding 3 further monitoring points during the second survey. Figures provided within the results section of this report illustrate the approximate location of each surveyor and monitoring point.

D.4.1.3 *DUSK EMERGENCE/DAWN SWARMING SURVEY – ENVIRONMENTAL CONDITIONS*

Details of the environmental conditions for each activity survey are provided within the appendices.

D.4.1.4 *SURVEY EQUIPMENT*

- Duet bat detectors
- Anabat Expresses
- Night vision camera
- Light meter

D.4.2 DATA ANALYSIS

All bat calls were analysed using Analook with calls identified to species where possible, referencing call parameters as detailed within Russ (2012)[20] and Middleton et al (2014)[21].

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.

TABLE 8: PIPISTRELLE SPECIES IDENTIFICATION PARAMETERS

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.

[20] Russ, J. (2012) British Bat Calls: A Guide to Species Identification. Pelagic Publishing
[21] Middleton, N., Froud, A. and French, K. (2014) Social Calls of the Bats of Britain and Ireland. Pelagic Publishing

D.5 PERSONNEL

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

TABLE 9: PERSONNEL

Name	Position	Professional Qualifications	Natural England Survey Licence Numbers
Dr Tony Martin	Director	BSc PhD MLI MCIEEM	2015-10138 CLS-CLS
Mary Martin	Director	BSc MCIEEM	2015-12822-CLS-CLS

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

D.6 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 Management[22], 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.

TABLE 10: ECOLOGICAL RECEPTOR VALUATION

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

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

TABLE 10: ECOLOGICAL RECEPTOR VALUATION	
Level of Value	**Examples**
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',*	

E. RESULTS

E.1 DESKTOP STUDY

E.1.1 PRE-EXISTING INFORMATION

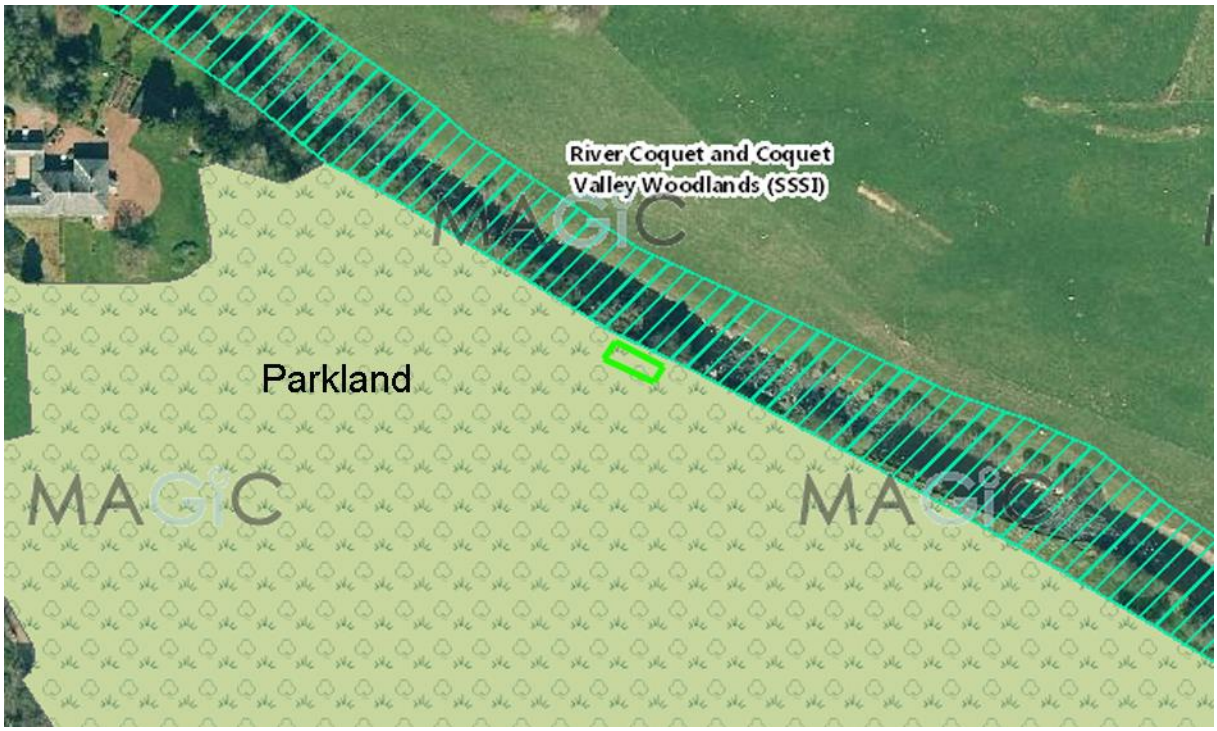
ORDNANCE SURVEY MAPPING AND AERIAL PHOTOGRAPHY

The most recent aerial photograph of the site (Section D, 2019) indicates that habitats on site are dominated by the building, surrounded by trees with pasture to the south. Historic imagery suggests that this has remained unchanged since at least 2002.

MAGIC WEBSITE[23]

There are no internationally and nationally statutorily designated sites for bats within 2km.

The site lies within a SSSI IRZ which is of relevance to this development. The River Coquet and Coquet Woodlands SSSI lies immediately to the north, Harbottle Woods SAC (~980m) & SSSI (~730m) and Holystone North Wood SSSI (~1.5km) lie within 2km. The site sits within woodpasture and parkland BAP habitat and is within Northumberland National Park.



E.1.2 CONSULTATION

LOCAL BAT GROUP

Consultation with the bat group has been undertaken and results will be added to this report on receipt, if they provide information relevant to the site.

Full data sets are available on request.

[23] MAGIC Website: www.magic.gov.uk

E.2 DAYTIME RISK ASSESSMENT

E.2.1 HABITATS

The site lies within high quality foraging habitat for bats, with woodland and pasture immediately adjacent, the river to the north and woodland in the wider area. The village of Harbottle to the east, photo below, provides alternative roosting opportunities. The open nature of the building, and to a greater extent the adjacent trees, provides a small area of foul weather foraging potential.

E.2.2 BUILDINGS

The following text and photos below provides building descriptions and the location of each structure is illustrated within the figure below. Where recorded, field signs that confirm bat use are in bold.

Section 1 (approximately 60% of structure)

- Single storey
- Pitched slate roof, mostly unlined but with approximately half of the southern elevation on timber sarking.
- Some missing slates
- Stone walls, moderately pointed internally and poorly pointed externally.
- Stone water tables to western gable, eastern gable exposed.
- Some clean crevices internally and externally but no definite field signs of bat use recorded.
- Roof with significant risk of failure in the near future.

Section 2 (approx. 40%)

- Single storey
- No roof; original roof would have been slightly lower than Section 1

- Stone walls, some crevices but part had been repaired and was well pointed. Eastern gable and north eastern corner had been reinforced with block work at the time of survey.


Section 1


Section 2


Rear Section 1


Rear Section 1

E.2.3 TREES

The building lies on the edge of a strip of woodland, but 8 mature trees lie immediately around the structure. Three of these (trees 1 a multi-stemmed sycamore, 5 an elm and 7 an ash on the figure below, outlined turquoise) are considered of low-moderate suitability for bats. The remainder are of low (trees 3, 4, 5, 8) or negligible (tree 2) suitability.

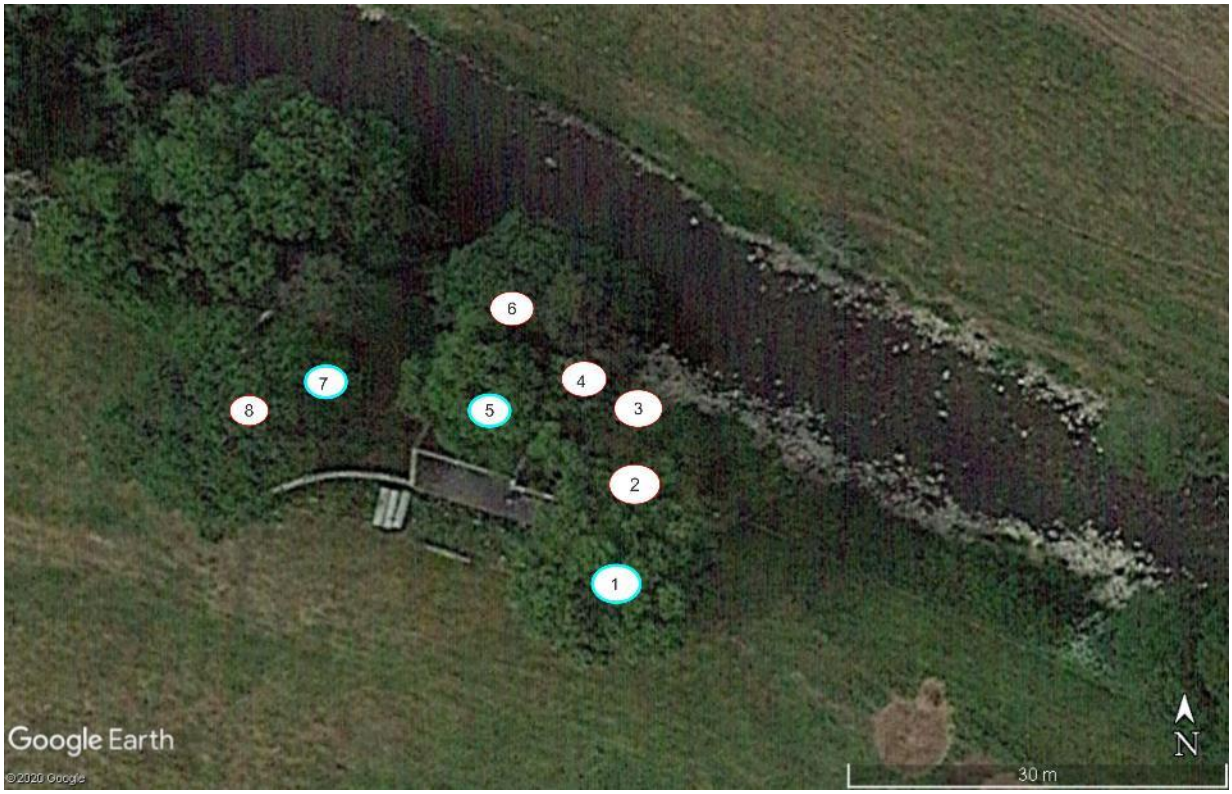


FIGURE 4: TREE LOCATIONS
(Reproduced under licence from Google Earth Pro.)

E.3 OVERVIEW OF SITE SUITABILITY

TABLE 11: OVERVIEW OF SITE SUITABILITY FOR BATS

	HABITATS AND SETTING[24]			
	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
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/	>1km	500m-1000m	200m-500m	<200m

[24] 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 11: OVERVIEW OF SITE SUITABILITY FOR BATS				
SCRUB				
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]				
	NEGLIGIBLE	**LOW**	**MODERATE**	**HIGH**
AGE (APPROX.)	Modern	Post 1940's	1900-1940	Pre 20th 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	Very open not weatherproof	Some potential access routes, slates, tiles	Uneven with gaps, not too open, stone slates
ADDITIONAL FEATURES	Very well maintained and tightly sealed	No additional 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
TREES				
	NEGLIGIBLE	**LOW**	**MODERATE**	**HIGH**
AGE	Young to semi-mature	Early Mature	Mature	Over mature/Veteran
SPECIES	Conifer or broadleaved with smooth bark	Broadleaved with rough bark	Scot's Pine	Oak, beech, elm, ash
HEALTH	Good to moderate	Poor	In decline	Dying/dead
FEATURES	No or sub-optimal features	Features with potential in use by birds/insects	Features with potential present but not in obvious use	Features with potential present and potentially in use by bats
CLIMBING SHRUBS	Absent or present but undeveloped	Present and developing	Covering most of tree	Contributing to decay of tree
LOCATION	In a plantation or urban environment	Isolated in exposed hedgerow	Good bat habitat surrounded by high potential trees	Good bat habitat surrounded by low potential trees
HABITAT	Urban environment	Urban/Rural fringe with good connectivity	Well-connected farmland with a good habitat mosaic	Mature woodland well connected to foraging or overlooking at watercourse

Overall, the building is considered of moderate suitability, in a high suitability setting. Trees immediately adjacent range from negligible to low-moderate.

E.4 ACTIVITY SURVEY

E.4.1 DUSK EMERGENCE/DAWN SWARMING ACTIVITY SURVEY

2nd July 2020

The majority of bat activity was soprano pipistrelle and *Myotis* with call parameters indicating potentially two *Myotis* species, including Daubenton's which were seen foraging low over the river. Two soprano pipistrelle emerged from section 1, the first at 21.53, approximately 6 minutes after sunset (lux ~180) from under the gutter and one at 22.27 (lux ~10) again from eaves/gutter height. At the same time as the second soprano pipistrelle emergence, a *Myotis* bat was thought to have potentially emerged from the inside of the building. Early bat activity was associated with the tree canopies. There was regular but generally low level foraging around the building and along the river, with commuting activity of both species also indicating a potential roost within the village. A possible individual soprano pipistrelle roost was identified within a tree close to, but outside the site. Occasional common pipistrelle and noctule passes were recorded. As light levels fell bat activity over the open field increased.

Approximate location of proven roost locations (both individual soprano pipistrelle). A *Myotis* bat was also thought to have emerged from the open front, potentially roosting within internal walls or ridge.

16th July 2020

Survey was undertaken in warm (17c), dry conditions with a light wind. A single *Myotis* bat emerged from the eastern gable at 22.30 (~52 minutes after sunset, lux ~1.6). No other roosts were identified, but regular soprano foraging and commuting activity indicated a roost to the east, possibly maternity. Daubentons were again foraging along the river. There was common pipistrelle foraging later in the survey, and individual brown long eared passes.

Key survey data are provided in Appendix 4. The figure below provides a summary of the results of dusk emergence/dawn swarming surveys.

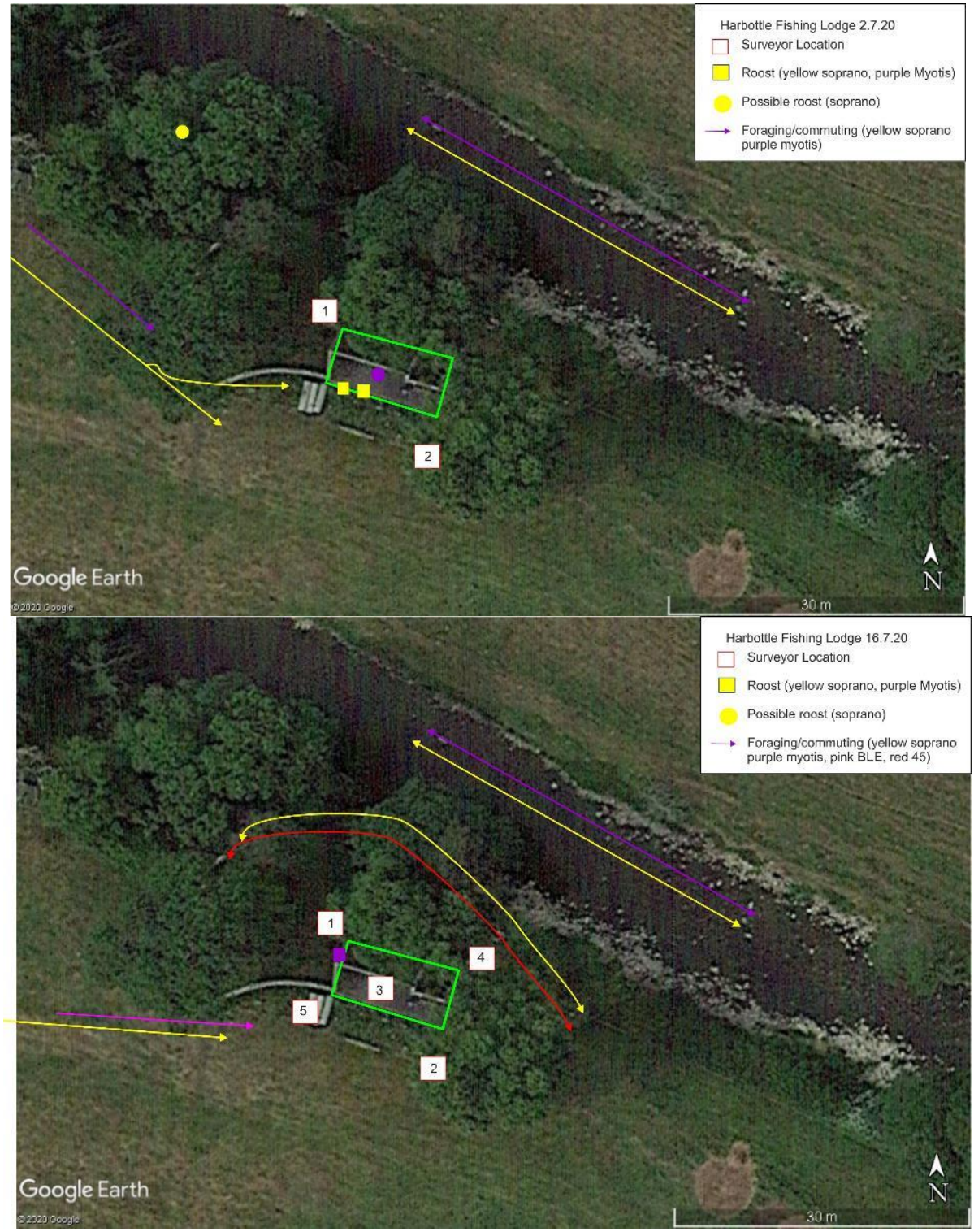


FIGURE 5: SUMMARY OF DUSK EMERGENCE SWARMING SURVEY RESULTS
(Reproduced under licence from Google Earth Pro.)

E.5 ADDITIONAL SPECIES GROUPS

No evidence of barn owl was recorded. The building and adjacent trees and vegetation provide potential for nesting birds, although no active nests were recorded in the building during surveys.

Otter will forage along the river and there are potential lying up areas along the river bank adjacent to the site. Badger and red squirrel are likely to be present within the wider area although no evidence of their presence was seen adjacent to the site.

A monkey flower *Erythranthe guttata* plant was recorded on the river edge just to the north east of the lodge, an introduced invasive species. Immediately around the building habitats were woodland with an understorey including foxglove *Digitalis purpurea (*dominant immediately adjacent*),* red campion *Silene dioica*, herb robert *Geranium robertianum*, crosswort *Cruciata laevipes*, chickweed *Stellaria sp.,* hogweed *Heracleum sphondylium (dominant),* dogs mercury *Mercurialis perennis,* nettle *Urtica dioica* and cleavers *Galium aparine,* with the more diverse species range recorded particularly as the bank starts to slope towards the river. Areas immediately to the south and west were more coarse grassland or bare ground following the repair works to the walls. Beyond the fence to the west lies sheep grazed pasture.

F. SITE ASSESSMENT

F.1 ASSESSMENT OF SURVEY FINDINGS

Roosts have been proven, within the building, which are considered of local value.

Habitats within the site's likely footprint comprise a small number of mature trees with an understorey of local value, but links to the woodland corridor which is within the immediately adjacent SSSI.

F.2 POPULATION SIZE CLASS ASSESSMENT

From the field survey, it is concluded that the buildings are used by small numbers of bats, 1-2 soprano pipistrelle and individual Myotis bats, at intervals through the year. The buildings are used as summer non-breeding day roost site and perhaps as a hibernation site.

F.3 LIMITATIONS AND CONSTRAINTS

No significant constraints to survey were encountered.

Survey completed at the site will provide reasonably typical data for the summer period. Assessment of the bat use of the site at other times of year and the potential impacts of the proposed development is based on professional judgement. This is an approach supported by the Bat Conservation Trust Good Practice Guidelines[25].

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

G. IMPACT ASSESSMENT

Potential impacts of the development are likely to include:

- Impacts on the adjacent SSSI during construction, through lighting and drainage/sewerage provision and through visitors accessing the river banks (though this is likely to be only a small number given the size of the structure).
- The loss of a small number of proven crevice roost sites and other potential crevice roosting opportunities.
- Disturbance or harm to a small number of bats that may be using the buildings at the time of proposed works, potentially including hibernating bats if works are undertaken during the winter.
- Restoration of a structure that is likely to otherwise degrade rapidly in the near future.
- Impacts on adjacent BAP habitat, through provision of access track.
- Increased levels of disturbance due to occupants of the properties, following on from the conversion.
- Increased lighting levels affecting foraging and commuting routes used by bats, and potential light spill onto the woodland and river corridor likely to be used by other protected species.
- Harm/disturbance to nesting birds should any tree/vegetation removal be undertaken during the bird nesting period (March-August).
- Damage to retained trees during construction.

H. RECOMMENDATIONS

H.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 September.

A checking survey for badger, otter and red squirrel is recommended within the 3 months prior to works commencing.

H.2 AVOIDANCE AND MITIGATION STRATEGY

Mitigation includes:

H.2.1 SITE DESIGN

- Land take around the building will be minimised.
- Foul drainage from the building will flow to a package treatment plant to be sited to the south west of the building along with sustainable drainage measures for the surface water drainage.
- Vehicular use of the adjacent BAP habitat will be minimised with any reinforced surfacing being of a design which will grass-over.
- External lighting that may reduce bat use of both the building and the surrounding woodland will be avoided. High intensity security lights will be avoided, and any lighting on the woodland/river corridor will be avoided, if at all possible, otherwise be low level (2m) and low lumen (less than 2 lux).
- Trees retained and protected in accordance with the arboricultural report during works.
- Breathable roofing membranes will not be used in locations that may be accessible to bats.

H.2.2 TIMING OF WORKS

- Works to the building will not commence until a Natural England bat development licence has been obtained.
- Bat boxes (as detailed below) will be provided on site prior to works commencing to provide roosting opportunities during the works.
- Prior to works commencing a site induction meeting will be held, attended by the project ecologist and lead contractors.
- Works will not commence until a detailed inspection of the structure has taken place once scaffolding has been provided.
- The following key elements of work will not be started during the hibernation period (mid-November to end Feb inclusive):
  - Demolition of stonework
  - Re-structuring/re-pointing of existing stonework
  - Removal of ridge tiles and slates
  - Removal of roof timbers
  - Exposing of the wall tops via roof stripping works
- Within the 3 months prior to start of works a badger, otter and red squirrel checking survey will be undertaken to confirm no setts, lying up areas or dreys are present within 30m of the site boundary.
- Should any vegetation removal be required, this will avoid the bird nesting period (March to August inclusive) unless a check by a suitable experienced ornithologist has confirmed that active nests are absent.

H.2.3 WORKING METHODS AND BEST PRACTICE

- A copy of the relevant Natural England licence method statement will be provided to contractors prior to the induction process at the start of works. The project ecologist will review all key points with contractors during the induction and provide all necessary training.
- Once scaffolding access is provided the project ecologist will carry out a detailed inspection of the structures and mark up crevice roost sites and access points to be retained.
- Old slates, coping stones, ridge tiles and barge boards 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 door 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).

H.3 COMPENSATION STRATEGY

The following compensation strategy is proposed:

H.3.1.1 *BAT BOXES*

In advance of the start of works 6 bat boxes with a ten year design life will be erected in adjacent trees, 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.

Boxes will include 2 suitable for use for hibernation use by small numbers of bats.

H.3.1.2 *CREVICE ROOST SITES*

A total of 6 external crevice roost sites within the stone walls will be marked up and access retained/created through careful repointing. Such gaps will be from 15-20mm wide and 40-80mm long, or repointed to create such a gap by using a roll of newspaper 20mm in diameter angled upwards into the gap, applying the mortar around, and then removing the paper before the mortar is fully cured to leave a weather-proof access route for bats.

H.4 MONITORING

Given the nature of the proposed mitigation and/or compensation strategies, no monitoring is proposed.

H.5 ADDITIONAL ENHANCEMENT RECOMMENDATIONS

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

- 6 bird boxes within retained trees.

APPENDIX 1. STATUTORILY AND NON- STATUTORILY DESIGNATED SITES

STATUTORILY DESIGNATED SITES

Ramsar Site
Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. The Convention recognizes wetlands as important ecosystems and includes a range of wetland types from marsh to both fresh and salt water habitats. The wetlands can also include additional areas adjacent to the main water-bodies such as river banks or coastal areas where appropriate.

Special Protection Areas (SPA)
SPAs are classified by the UK Government under the EC Birds Directive and comprise areas which are important for both rare and migratory birds.

Special Areas of Conservation (SAC)
SACs are designated under the EC Habitats Directive and are areas which have been identified as best representing the range and variety of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the Conservation of Habitats and Species Regulations 2017 (as amended) unless they are offshore.

Sites of Special Scientific Interest (SSSI)
SSSIs are designated as sites which are examples of important flora, fauna, or geological or physiographical features. They are notified under the Wildlife and Countryside Act 1981 with improved provisions introduced by the Countryside and Rights of Way Act 2000. They are often components of larger SACs or SPAs.

National Nature Reserve (NNR)
NNRs are designated by Natural England under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 and support important ecosystems which are managed for conservation. They may also provide important opportunities for recreation and scientific study.

Country Parks
Country Parks are statutorily designated and managed by local authorities in England and Wales under the Countryside Act 1968. They do not necessarily have any nature conservation importance, but provide opportunities for recreation and leisure near urban areas.

Local Nature Reserve (LNR)
LNRs are designated under the National Parks and Access to the Countryside Act 1949 by local authorities in consultation with Natural England. They are managed for nature conservation and used as a recreational and educational resource.

NON-STATUTORILY DESIGNATED SITES

Non-Governmental Organisation Property
These are sites of biodiversity importance which are managed as reserves by a range of NGOs. Examples include sites owned by the RSPB, the Woodland Trust and the Wildlife Trusts

Local Wildlife Site (LWS)
These are sites defined within the local plans under the Town and Country Planning system and are material considerations of any planning application determination. They are designated by the local authority although criteria can vary between authorities.

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[26]

SURVEY TYPE	J		F		M		A		M		J		J		A		S		O		N		D	
Roost Inspection																								
Mating/ Swarming Survey																								
Hibernation Survey																								
Tree survey from the ground																								
Tree roost activity survey																								
Building roost activity survey																								

Dark grey are optimal timings, light grey suboptimal.

BAT ROOST USE THROUGH THE YEAR

Day Roost																								
Night Roost																								
Feeding Roost																								
Transitional/ Occasional Roost																								
Swarming Site																								
Mating Site																								
Maternity Roost																								
Hibernation Roost																								
Satellite Roost																								

[26] 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 uncommon[27]. 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 roosts[28].

Maternity colonies of brown long-eared bats are generally small, consisting of 10 to 20 adults[29,30] (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 tunnels[31]. 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 Scotland[32]. 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

[27] Roberts, G.M. & Hutson, A.M. 2000. *Pipistrelle*. British Bats No. 6. The Bat Conservation Trust, London
[28] Corbet, G.B & Southern, H.N., 1964. The handbook of British Mammals).
[29] 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
[30] 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
[31] 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.
[32] 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.

bats[33]. 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 used[34].

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 crevices[33].

Brandt's bat is thought to have similar roosting behaviour and foraging ecology to the whiskered bat, however, further research is needed to clarify this[33].

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

[33] Altringham, J.D. 2003. British Bats. The New Naturalist. Pub. Harper Collins.
[34] 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 list of development types likely to affect bats where they impact on particular features is provided within the table below.

PLANNING AND DEVELOPMENT TRIGGER LIST FOR BAT SURVEYS[35]	
NATURE OF WORK	**TYPE OF BUILDING OR FEATURE**
Conversion, modification, demolition or removal of buildings (including hotels, schools, hospitals, churches, commercial premises and derelict buildings)	Agricultural buildings e.g. farmhouses, barns and outbuildings) of traditional brick or stone construction and/or with exposed wooden beams
	Buildings with weather boarding and/or hanging tiles that are within 200m of woodland and/or water
	Pre-1960 detached buildings and structures within 200m of woodland and/or water
	Pre-1914 buildings within 400m of woodland and/or water
	Pre-1914 buildings with gable ends or slate roofs, regardless of location
	Buildings located within, or immediately adjacent to woodland and/or immediately adjacent to water
	Dutch barns or livestock buildings with a single skin roof and board and gap or Yorkshire boarding if following a preliminary roost assessment, the building appears particularly suited to bats
Any development works	Any underground duct or structure including tunnels, mines, kilns, ice houses, adits, military fortifications, air raid shelters, cellars
	Unused industrial chimneys that are lined and of brick/stone construction
Floodlighting	Churches and listed buildings, green space (e.g. sports pitches) within 50m of woodland, water, field hedgerows or lines of trees with connectivity to woodland or water
	Any building listed in reference 1
Felling, removal or lopping	Woodland
	Field hedgerows and/or lines of trees with connectivity to woodland or water bodies
	Old and veteran trees that are more than100 years old
	Mature trees with obvious holes, cracks or cavities or which are covered with mature ivy (including dead trees)
Any development works	Within 200m or rivers, streams, canals, lakes, reedbeds or other aquatic habitats
Any development works	Within or immediately adjacent to quarries or gravel pits
	Immediately adjacent to or affecting natural cliff faces and rock outcrops with crevices or caves and sinkholes
Any single or multiple wind turbine construction	N/A – although for single turbines this can depend on size and location
Any development works	Sites where bats are known to be present

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

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.				

APPENDIX 4. BATS ACTIVITY SURVEY RESULTS

Site	Harbottle		Job No		Date	2.7.20	No. of Surveyors	2
Start Time	21:30	End Time	23:14	Sunset Time		21:47	No. of Remotes	0
Sunset Temp (°C)	14.5	End Temp (°C)	12.2	Start Cloud Cover (%)		30	End Cloud Cover (%)	70
Start Wind (F)	F1	End Wind (F)	F1	Start Precipitation		Dry	End Precipitation	Dry

Roosts
Two individual soprano pipistrelle day roosts
Probable individual Myotis roost
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Times given below detail emergence/possible emergence & first record of each species for each surveyor

Lux	Time	Surveyor 1	Surveyor 2
	21:30		
	21:35		
	21:40		
327	21:45		
260	21:50	55 (21.53)	21.53 55 from under gutter, S elevation
180	21:55	22.00 55 possible emergence from off-site ash tree	55
139	22:00	55	
90	22:05		
52	22:10		45 (22.10, commmuting), 55
29	22:15	55	55
16	22:20	Myo (22.22), 55, Noc (22.28 1 pass), 45 (22.36, only occasional passes)	Noc (22.22)
10	22:25		22.27 55 from under gutter (different location to 1st). Myotis probably from inside of building
7.5	22:30		55, Myo, activity starting to reduce around 22.45
4.4	22:35		
2.5	22:40		
1.6	22:45		
0.9	22:50		
0.3	22:55		
	23:00		
	23:05		
	23:10		
	23:15		

Sunset		Emergence		Bat Key			
Potential Emergence		Foraging/Commuting		*Common pipistrelle*	45	*Daubenton's*	Dab
Surveyors				*Soprano pipistrelle*	55	*Noctule*	Noc
1	Mary Martin			*Nathusius' pipistrelle*	39	*Serotine*	Ser
2	Tony Martin			*Natterer's*	Nat	*Leisler's*	Nat
Other Recorded	None			*Whiskered/ Alcathoe's/Brandt's*	WAB	*Brown Long Eared*	BLE

Species		*Unknown*	?	*Myotis*	Myo

Site	Harbottle		Job No	6270	Date	16.7.20	No. of Surveyors	2
Start Time	21:30	End Time	23:15	Sunset Time		21:38	No. of Remotes	3
Sunset Temp (°C)	17	End Temp (°C)	17	Start Cloud Cover (%)		10	End Cloud Cover (%)	10
Start Wind (F)	F1	End Wind (F)	F1	Start Precipitation		Dry	End Precipitation	Dry

Roosts

1 x Myotis from northern gable end wall top

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Times given below detail emergence/possible emergence & first record of each species for each surveyor

Lux	Time	Surveyor 1	Surveyor 2	Surveyor 3	Surveyor 4	Surveyor 5
400	21:30					
362	21:35					
220	21:40					
150	21:45	55 (21.49 in from field)				
102	21:50					
67	21:55	55	55 (21.56)			55 (21.57)
45	22:00	55			55 (22.05)	
27	22:05				55	
15	22:10					
9	22:15	55, Myo (22.19 on river)		55 (22.15 seen flying in)		
5.4	22:20	55, 45 (22.24)		55		
3	22:25	45, 55, Myo (river)		45 (22.28 v brief), 55	45 (22.28), 55	55, Myo (22.27)
1.6	22:30	22.30 1 x Myo from N gable, BLE (22.31 in from field)	45 (21.30), 55, BLE (22.31)	45, 55 (intermittently)		45 (22.31) BLE (22.31)
0.8	22:35	Myo, 55	45, 55			55
	22:40	55			Myo (21.35), 45, 55 intermittently to end	45, 55
	22:45	45, 55				55
	22:50	Myo, 55				
	22:55					
	23:00					
	23:0			Myo (23.07)		45. Myo

	5						
	23:10		55				
	23:15						

Sunset		**Emergence**		**Potential Emergence**		**Foraging/ Commuting**	

Surveyors		**Bat Key**			
1	M Martin	***Common pipistrelle***	45	***Daubenton's***	Dab
2	A Martin	***Soprano pipistrelle***	55	***Noctule***	Noc
3	Anabat 1 (inside)	***Nathusius' pipistrelle***	39	***Serotine***	Ser
4	Anabat 2 (NE corner)	***Natterer's***	Nat	***Leisler's***	Nat
5	Anabat 3 (SW corner)	***Whiskered/ Alcathoe's/Brandt's***	WAB	***Brown Long Eared***	BLE
Other Species Recorded	None	***Unknown***	?	***Myotis***	Myo