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Ecological Consultants
Environmental and Rural Chartered Surveyors

BAT SURVEY AT

Holden Clough Nursery, Bolton-by-Bowland

Green at Heart BEN GOLD

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Accuracy of report

This report has been compiled based on the methodology as detailed and the professional experience of the surveyor. Whilst the report reflects the situation found as accurately as possible, bats are wild and can move freely from site to site. Their presence or absence detailed in this report does not entirely preclude the possibility of a different past, current or future use of the site surveyed.

We would ask all clients acting upon the contents of this report to show due diligence when undertaking work on their site and or in their interaction with bat species. If bats are found during a work programme and continuing the work programme could result in their disturbance, injury or death either directly or indirectly an offence may be committed.

Bats may only be disturbed, injured or killed under licence.

If in doubt, stop work and seek further professional advice.

Quality and Environmental Assurance

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Signed

Andrew Gardner BSc (Hons), MSc, MCIEEM, MRICS, CEnv, Dip NDEA
Director

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1. EXECUTIVE SUMMARY

It is understood that works will be undertaken to upgrade the buildings at Holden Clough Nurseries, Holden.

It is intended that a single story extension is added to the Tearoom at the site whilst the Potting Shed will be demolished and rebuilt. There are currently no works planned for the Bungalow on the site although an application may be made at a later date.

A daytime inspection was undertaken on the 31st May 2018. This involved a close inspection of the buildings for signs of use by bats both internally and externally.

A desk study and data search were also undertaken to ensure the reasonable probable use of the site by bats could be determined.

The habitat around the site offers a moderate-high potential for foraging, consisting of farmland, hedgerows and the adjacent Holden Beck with associated trees. There is good connectivity between the site and higher quality foraging areas.

The buildings have high potential for use by bats.

Two emergence surveys were undertaken in accordance with Collins, J (ed) (2016) on 31st May 2018 and 12th July 2018.

Two soprano pipistrelle bats were identified roosting high on gable walls of the Tearoom during each survey visit, in areas that will not be affected by the proposals.

No bats were observed utilising the potting shed on site for any purpose.

There was use of the Bungalow on site by low numbers of *Myotis* spp. bats. These bats will not be affected by the current proposals.

On the basis of the survey work carried out, under guidance provided in respect of the Conservation of Habitats and Species Regulations (2017), and considering the plans for the site, **it is considered that a European Protected Species Mitigation (EPSM) Licence for bats will not be required prior to works being carried out.**

A mitigation strategy has been prepared and should be followed in order to ensure that the welfare of the local bat population is maintained during, and following the works.

2. INTRODUCTION

2.1 Site Description

The site lies in a rural location in the hamlet of Holden, approximately 1km west of Bolton-by-Bowland. The surveyed buildings comprise:

- Bungalow - stone and wood-panelled building under a concrete interlocking tile roof,
- Tearoom - single storey stone built building under a slate roof,
- Potting shed – single storey brick built building, mostly rendered, under a moss and sedum roof.

There is fragmented woodland in the local area and Holden Beck runs past the eastern boundary. The site is in a sheltered position at SD77349 49535, Figure 1 and 2.

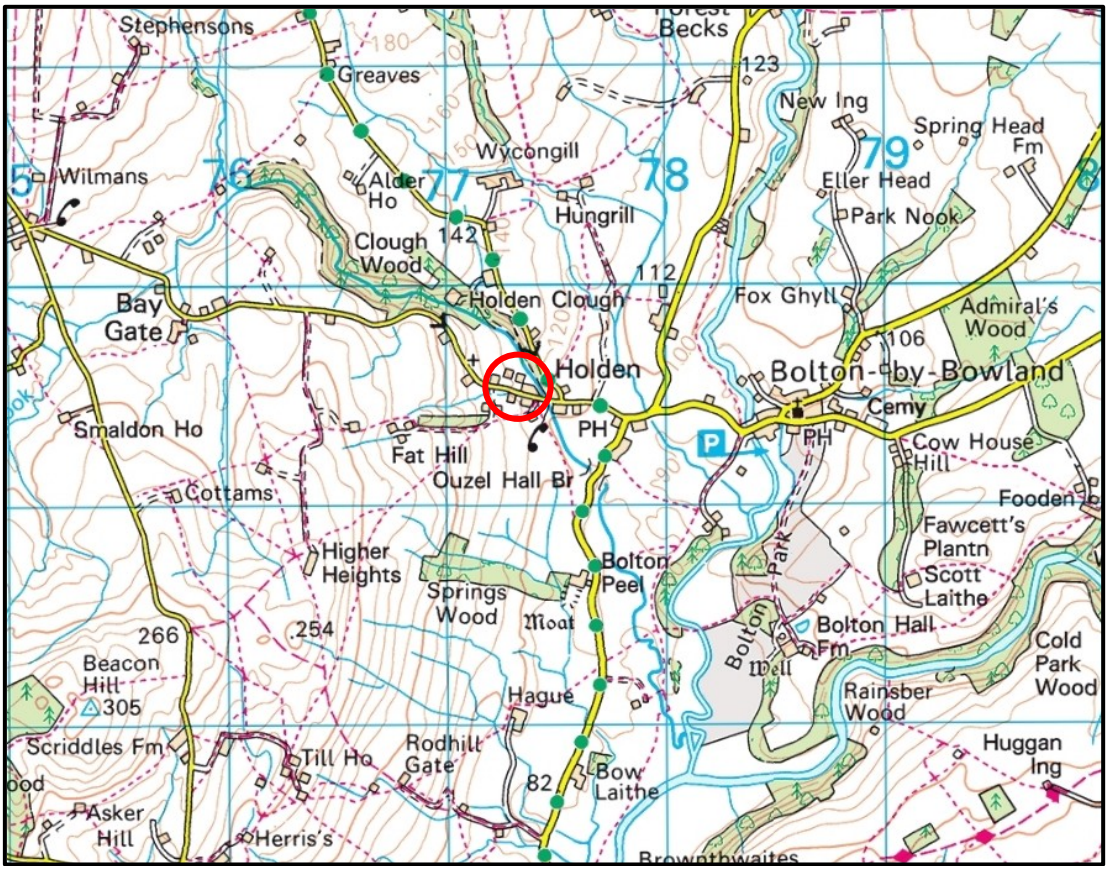
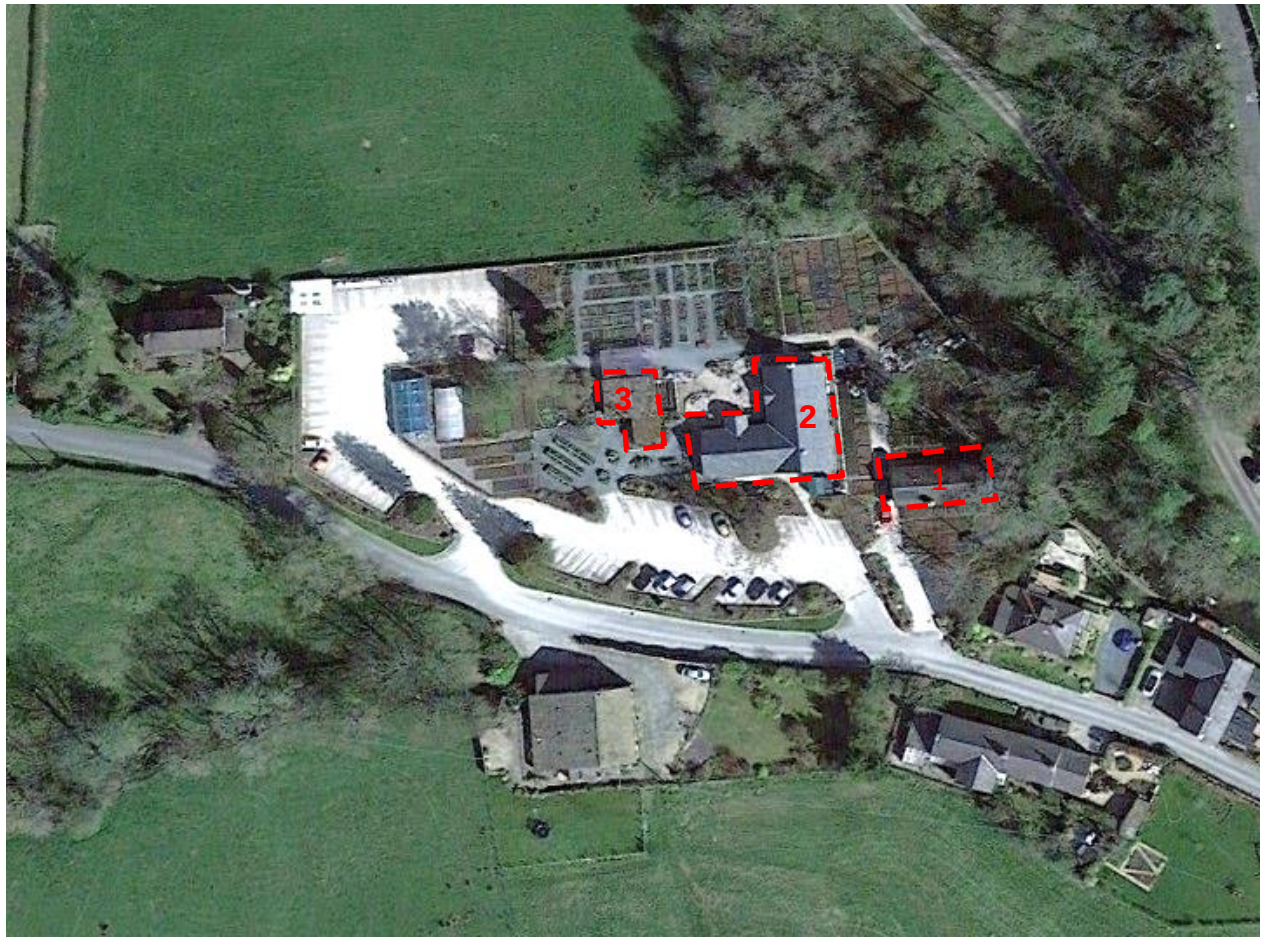


Figure 1 *Ordnance Survey map of site location, circled red.*



Key

Site Boundary

N

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Figure 2
Buildings

SCALE: NTS

REV 01

2.2 Proposed Works

It is proposed that the Tearoom is extended at ground floor level and the Potting Shed is demolished. A decision has yet to be made on the proposals for the Bungalow and it is therefore likely this building will be subject to a separate application at a later date. The Bungalow has however been covered in this report due to the presence of roosting bats and its proximity to the other buildings on site.

The timing of work is unknown.

2.3 Aims of Study

To ensure that the proposed development does not affect any bat species, barn owls or nesting birds which are listed under the Conservation (Natural Habitats, &c) Regulations (2017) and or the Wildlife and Countryside Act (1981) (as amended) the survey will:-

- ⇒ Identify past and/or current use of the site by bat species, barn owls and nesting birds.
- ⇒ Assess the likely impact of the proposed development on these species.
- ⇒ Provide an outline mitigation/compensation scheme (if required) for bat species, barn owls and nesting birds affected by the development.

3. METHODOLOGY

3.1 Bats

3.1.1 Rationale of Survey

The methods used **comply with those described in** Hundt (2012) and Collins, J (ed) (2016). The following extracts from Collins, J (ed) (2016) are used to determine the appropriate level of survey in accordance with the guidelines.

Key point 1: Guidelines should be interpreted using professional expertise.

> *"The guidelines do not aim to either override or replace knowledge and experience. It is accepted that departures from the guidelines (e.g. either decreasing or increasing the number of surveys carried out or using alternative methods) are often appropriate. However, in this scenario an ecologist should provide documentary evidence of (a) their expertise in making this judgement and (b) the ecological rationale behind the judgement.*
>
> *Equally, it would be inappropriate for someone with no knowledge or experience to read these guidelines and expect to be able to design, carry out, interpret the results of and report on professional surveys as a result, simply following the guidelines without the ability to apply any professional judgement."* Section 1.1.3

Key point 2: Guidelines are descriptive rather than prescriptive and must be adapted on a case by case basis.

> *"The guidelines should be interpreted and adapted on a case-by case basis according o site-specific factors and the professional judgement of an experienced ecologist. Where examples are used in the guidelines, they are descriptive rather than prescriptive."* Section 1.1.3

Key point 3: Surveys should be undertaken where it is reasonably likely bats are present and may be affected by the proposal. Where bats are not likely to be present and or will not be affected by the proposal, survey could but need not be undertaken.

> *"It is reasonable to request surveys where proposed activities are likely to negatively impact bats and their habitats. However, surveys should always be tailored to the predicted, specific impacts of the proposed activities (see Section 2.2.2). Excessive, speculative surveys are expensive and cause reputational damage to the ecological profession."* Section 2.1

Key point 4: Surveys should be proportionate to predicated impacts.

> *"When planning surveys it is important to take a proportionate approach. The type of survey (or suite of surveys) undertaken and the amount of effort expended should be proportionate to the predicted impacts of the proposed activities on bats. Clause 4.1.2 of BS42020 (BSI, 2013) states that 'professionals should take a proportionate approach to ensure that the provision of information with the (planning) application is appropriate to the environmental risk associated with the development and its location"* Section 2.2.5

3.1.2 Desk Study

"The aim of a desk study for bats is to collate and review existing information about a site and its surroundings to inform the design of subsequent bat surveys." Section 4.2.1

"As a minimum, it is recommended that background data searches should be carried out upto 2km from the proposed development boundary." Section 4.2.2

Key point 5: A records search was undertaken of the Envirotech dataset. No additional data searches were considered necessary at this site as the bat species likely to be found in the local area could be adequately determined from the records searched.

"The desk study records provide contextual information for the survey design stage as well as the evaluation of the survey results. They should be interpreted to identify:

- *If proposed activities are likely to impact on a SAC or the qualifying feature of a SAC (this may trigger the need for a HRA);*
- *If the proposed activities are likely to impact on other designated sites and thus require consultation with relevant bodies;*
- *Any species (or genera) confirmed/thought to be present;*
- *Any bat roosts that will be impacted (on or off-site);*
- *If it is likely that the CSZs of bats from roosts off-site will be impacted (see Section 3.7);*
- *If there are any rare species in the area that may require species-specific survey methodologies."* Section 4.2.3

Key point 6: Likely bat roosting and feeding sites on and adjacent to the site were identified from aerial photography and the use of Google Street View for ground level analysis. This allows us to identify habitat connectivity and potential foraging areas at a landscape level. We are also able to relate the results of the records search against habitat types and the species of bat which could and or are recorded in the local area. Identification of bat species which may occur locally allows for additional field based surveys to be correctly targeted.

3.1.3 Field Survey

Key Point 7: To ground truth the desktop data (Key point 5) a field assessment of habitat at and adjacent to the site was made. This allows us to cross check our interpretation of aerial photography with actual habitat on the ground. There is occasionally significant change between landscape detailed on aerial photographs and habitat on the ground. Buildings, hedgerows and roads may be built or removed. For example occasionally woodland is felled or has been replanted.

"A preliminary ecological appraisal for bats is a walkover of the proposed development site to observe, assess and record any habitats suitable for bats to roost, commute and forage both on site and in the surrounding area (it is important that connectivity within the landscape is also considered at this stage). The aim is to determine the suitability of a site for bats, to assess whether further bat surveys will be needed and how those surveys should safely be carried out." Section 4.3.1

Key point 8: A thorough inspection of the walls and eaves was undertaken using a torch and short focus binoculars to locate potential bat roosts. Gaps and cracks in the walls or under the eaves and soffits may provide access to the buildings by bats. Where possible all gaps and

cracks judged to be of a suitable size for bats to take entry to the buildings were inspected either from the ground or the top of a ladder. Where appropriate an endoscope was used to fully inspect these gaps internally.

Key Point 9: A thorough inspection of the roof was undertaken using a torch and short focus binoculars to locate potential bat roosts. Gaps under the roof coverings, ridge lines and flashing may provide suitable roost sites for bats. All gaps and cracks judged to be of a suitable size for bats to take entry to the buildings were inspected either from the ground or the top of a ladder. Using short focus high quality binoculars and a torch to illuminate any gaps underneath the roof coverings it is often possible to see residual evidence of bats such as droppings, scratch, grease and urine staining, lichen build-up from increase nutrient levels or bats themselves.

A Flir E60bx thermal imaging camera was used to take thermographic readings of the buildings. Warmer and colder areas of the buildings were identified. Areas of rot in roof trusses, damp in walls and heat from hidden chimney flues or thermal gain from the walls and roof can all be distinguished. In addition the thermal bloom from bats roosting behind roof linings, soffit and eaves boards, roof flashing and occasionally within stone walls can be identified.

> *"Night-vision scopes or infrared or thermal imaging cameras can increase precision in presence/absence surveys because bats are less likely to be missed if the camera is pointed at the relevant access point. This can be particularly important where there is potential for late-emerging species (see Section 3.9) and in dark conditions (for example, under the tree canopy and among fluttering foliage).Thermal imaging was considered appropriate at this site."* Section 7.1.5

Key Point 10: A thorough inspection of the interior and exterior of the buildings to look for signs of bats such as grease or scratch marks, bat droppings and feeding detritus was made. Windows and or other items in and around the site were inspected for urine staining.

Key Point 11: A thorough search for detritus associated with bat feeding perches and roosts was undertaken. These roosts are usually in roof voids, under eaves and open buildings.

Key Point 12: Internal voids and rooms were assessed where it was considered bats may be able to take access. Indications of use such as grease and scratch marks, urine staining, droppings, desiccated young bats, dead bats in water tanks and cobweb free areas under the roof and roof supports were all assessed.

> *"The time needed for a preliminary roost assessment will vary according to the complexity of the structure and the number of ecologists deployed. Large structures with multiple roof spaces, multiple human access points and/or abundant voids and crevices will clearly take some time to understand and search thoroughly. Also, structures may contain several different bat roosts of different species each with their own access point and used at different times of the year. This all adds time to the survey."* Section 5.2.7

Key Point 13: It is the considered opinion of the surveyors who undertook this survey that the time taken to undertake the survey was sufficient given the complexity of the buildings, methods used, time of year and species of bat which may be present. The times in Collins, J. (ed) (2016) should be considered in light of Key Point 1 (Professional judgement), Key point 2

(interpretation on a case by case basis) and Key Point 3 (survey should cover areas where it is reasonably likely bats are present and may be affected by the proposal).

> *"Where the possibility that bats are present cannot be eliminated or evidence of bats is found during a preliminary roost assessment, then further surveys (such as winter hibernation (Section 5.3), presence/absence (Section 7.1) and/or roost characterisation (Section 7.2) surveys) are likely to be necessary if impacts on the roosting habitat (or the bats using it) are predicted. The ecologist should consider the further surveys needed (if any), their logistics (resources, emergence survey locations, timings), and any potential health and safety hazards reported.*
>
> *If the structure has been classified as having low suitability for bats (see Table 4.1), an ecologist should make a professional judgement on how to proceed based on all of the evidence available.*
>
> *If sufficient areas (including voids, cracks and crevices) 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.*
>
> *Information (photographs and detailed descriptions) should be presented in the survey report to justify this conclusion and the likelihood of bats being present at other times of the year estimated. If there is a reasonable likelihood that bat roosts could be present, and particularly if there are areas that are inaccessible for survey, then further surveys may be needed and these should be proportionate to the circumstances (see Section 2.2.5).*
>
> *If no suitable habitat for bats is found, then further surveys are not necessary. In this scenario, it is necessary to document how this decision has been reached; photographs and detailed descriptions should be made available as evidence of a robust survey and assessment."* Section 5.2.9

Key Point 14: Having undertaken a detailed inspection of the site, two additional presence/absence surveys were required:

A roost has been identified, but more information is needed in order to assess its importance and the potential significance of any impacts on it. Information may be needed on the number of bats within the colony, the access points, the species, and flight paths to and from the roost	☒
A comprehensive internal inspection survey is not possible because of restricted access, but given the sites location, bat species likely to be found in the local area, and potential roost sites, the structure or tree has a reasonable likelihood of supporting bats	☐
A comprehensive preliminary roost assessment is not possible because it is a sub-optimal time of year, or there is a risk that evidence of bat use may have been removed by weather, human activities or the presence of livestock	☐
A preliminary roost assessment has not ruled out the reasonable likelihood of a roost being present, but no definitive evidence of the presence of bats has been recorded.	☐
A preliminary roost assessment has ruled out the reasonable likelihood of a roost being present, but the surveyor was on site at a time of day when additional survey information could be gained to provide additional contextual information about the site and the opportunity to do so can be taken.	☐

Table 1 *Need for additional survey following preliminary ecological appraisal for bats.*

Key Point 15: Potential roost locations were identified during the initial survey and were all adequately covered during the emergence surveys. There was either direct visual coverage, with appropriate overlap between surveyors, coverage by infrared video camera or areas with limited visual coverage were noted and surveyors were positioned such that any bats emerging from these areas could be distinguished from bats which had commuted into the site.

Key Point 16: Bat commuting routes and activity in and around the site were observed and noted. The surveyors were either in visual and verbal contact or used 2-way radios to communicate bat activity over the site to each other. This reduced the potential for double counting or miss-recording bats which have flown into rather than emerged from the site or vice versa.

Key Point 17: A passive pre-emergence scan was made around potential roost sites with a bat detector set at 17 KHz. This would detect pre-emergence social chatter from bats. The surveyors were also listening for audible chatter during the inspection.

Key Point 18: An active scan was made with a bat detector post emergence. The surveyor adjusts the frequency of the bat detector in response to bat sightings to confirm species. Some bat detectors have auto-tuning capability, see Table 2.

Bat Detector	Capabilities	Used
Bat Box III	Heterodyne, manual tuning.	☐
Bat Box Duet	Heterodyne and frequency division, manual tuning.	☒
Echo Meter EM3(+)	Heterodyne, frequency division or time expansion. Recording capability, auto tuning.	☒
Anabat	Zero Crossing, recording capability.	☐

Table 2 *Bat detectors used and capabilities.*

3.1.4 Timing

"Recorded bat activity is dependent on the prevailing conditions at the time of the survey, which vary temporally (through the night, between nights, through the seasons and between years) and spatially (dependent on latitude and longitude).

Bat activity is also determined by what the bats are doing at different times of the year; in general:

- *April surveys may detect transitional roosts.*
- *May to August surveys may detect maternity colonies and males/non-breeding females in summer roosts.*
- *August is particularly good for maximum counts of both adults and juveniles and can be useful to observe roost re-entry because the young bats are inexperienced at flying and are often easy to observe as they try to enter the roost.*
- *August to October surveys may detect mating bats. September and October surveys may detect transitional roosts used after bats have dispersed from maternity colonies but before they go into hibernacula (although October may be less suitable for surveys in more northerly latitudes).*

It is important to stress that prevailing conditions and local trends in bat activity (for example, when were the young born in the year in question?) should be considered and recorded to provide context to survey results. Section 7.1.7

Key Point 19: Bats use of sites varies throughout the year. The "most active season" for bats is April – September. For assessing maternity colonies the optimum time period is May to August. Surveys should however be chosen to maximize the likelihood of detecting bat activity which may be between April and October for summer roosts and December and February for winter hibernation. There is overlap between the two periods which should be addressed by survey where appropriate.

The timing of the survey should therefore account for the functionality and potential of the site to be used by bats for different purposes. Some sites may be unsuitable for maternity roosting but have a high potential for transition or day roosts. Some sites may have the potential to perform several functions.

Mitchell-Jones (2004) indicate that:

> *"The presence of a significant bat roost (invariably a maternity roost) can normally be determined on a single visit at any time of year, provided that the entire structure is accessible and that any signs of bats have not been removed by others".*

Bats use different types of roost at different times of the year. The following roost types/ times shown on Figure 3 are taken from Mitchell-Jones (2004) and were considered in the assessment of this site. Times of the year given in Figure 3 should however be considered in light of factors such as fluctuations in temperatures between years, altitude, weather conditions, species and latitude which all affect the movement of bats between roost sites.

> *"An experienced surveyor should carry out surveys at a time that gives them the highest chance of establishing whether or not bats are present and how they are using the habitat including roosts). Actual timings will depend on a number of factors including the surveyor's knowledge and experience of the site and surrounding habitats, existing data records, possible bat species present, geographical location, weather conditions in that particular year and, of course, the aims and objectives of the survey."* Section 2.4

This site was assessed at the following periods in the bat year. Some roost types can be clearly identified when not in use or can be inferred from habitat type/residual evidence.

Month of Year		Jan		Feb		Mar		Apr		May		June		July		Aug		Sep		Oct		Nov		Dec	
Survey timing at this site =		☐	☐	☐	☐	☐	☐	☐	☐	☐	☒	☐	☐	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		Hibernation; activity in mild weather						Becoming more active		Maternity sites. Babies born in late-May/June, independent by July-August						Mating & swarming sites						Hibernation; activity in mild weather			
Activity surveys																									
Inspection of buildings and structures for roosts																									
Tree Survey- Emergence or re-entry surveys																									
Tree Surveys- Observation from the ground																									
Bat detector surveys for dusk/dawn emergence/re-entry for	Transitional Roost																								
	Maternity roosts																								
	Satellite Roost																								
	Mating Roost																								
	Hibernation Roost																								
	Night Roost																								
	Day Roost																								
	Feeding Roost																								
	Swarming																								

Figure 3 *Survey timing in the bat year from Mitchell-Jones (2004).*

Key Point 20: An assessment of the species of bat likely to be found at the survey site has been made (Key Point 5, 6, 7 and 8). An assessment of the weather and time of year before and during the survey was also made. The duration and timing of survey was considered proportionate to the species of bats likely to be found, potential roost types, weather and cover around potential roost entrances.

Key Point 21:

*"When presence is established, this should trigger **roost characterisation surveys** unless sufficient information has already been collected to inform the impact assessment and design of mitigation measures." – Section 7.2.1*

Based on the above criteria, two dusk activity surveys were undertaken. The number of surveys and timing are in accordance with Collins, J. (ed) (2016) Table 3, Figure 3 and Figure 5 because this allowed surveyors to ascertain the number and species of bats using the site.

Key Point 22:

Sunset is a very poor indicator of bat emergence times as lux levels associated with it are highly variable and are dependent upon atmospheric conditions. A combination of sunlight, high pressure, dry air dust particles and cloud cover can create a prolonged sunset. Delayed emergence can occur during very high pressure systems, which intensify and prolong sunsets. This can delay or bring forward emergence considerably and can skew conclusions as to how far bats have travelled from their roost if sunset is used as the time base from which activity is then monitored. Variations in local conditions also do not allow for comparisons to be made between emergence at different sites on the same day. The time of year also affects the time it takes to go dark with light levels falling and rising more quickly in spring and autumn than in summer when the arc of the sun is higher in the sky.

There is a variable correlation between sunset and lux levels hence we consider they should be used independently of each other. Lux levels provide a far greater degree of certainty in respect of identifying likely bat emergence time and commuting distances, time after sunset is a poor substitute for analysing bat activity information

Emergence of *Pipsitrelle* spp. usually commences at 200lux (from maternity roosts when bats have a high energy requirement) and 40lux from non-breeding and transitional roosts. Noctule are also an early emerging species at around 200lux. Emergence for whiskered/Brandts occurs between 40 and 4 Lux with brown long-eared and Daubenton's using emerging when light levels fall below 4 Lux.

During the activity survey lux levels were monitored by taking an average light reading, facing away from any potential roost sites at an angle of 45 degrees.

The activity survey continued until such a time as bat flight heights, emergence points and activity could no longer be reasonably determined. At this point the no additional useful information about the site could be gained.

Date of visit		31st May 2018		12th July 2018		Notes
Site inspection		1hr		0.5hr		
Weather conditions	Cloud	50%		90%		1
	Wind	Nil		Nil		1
	Rain	Nil		Nil		1
	Temperature	16°C		19°C		1
Emergence survey	Start/ Light Level	21:19	250 lux	21:27	250 lux	
	End/ Light Level	23:00	0.2Lux	23:10	0.2Lux	
Surveyors		MT, FW, JS		MT, FW, JS		

Table 3 *Survey dates and times.*

1. Weather conditions were considered acceptable for a survey at the site given the potential for use of the site and species which may be present. Bats are usually active with temperatures above 7 degrees Celsius.

Surveyors

1. (FW) Miss Flora Whitehead BSc (Hons)
   Natural England Bat Class Licence Agent (Level 1)

2. (MT) Mr Matthew Thomas BSc (Hons), Grad CIEEM
   Natural England Bat Class Licence (Level 2)

3. (JS) Mr Jack Sykes BSc (Hons), MCIEEM
   Natural England Bat Class Licence (Level 2)

4. DEFINITIONS

Definitions used in this report are detailed here, in reference to Hundt (2012) and Collins ed. (2016).

Building

A structure with walls and a roof, for example a residential property, block of flats, office block, warehouse, garden house, folly, barn, stable, lime kiln, tower, church, former military pill box, school, hospital or village hall. Some buildings have cellars (underground sites) beneath them.

Built structure

A structure that was made by humans but cannot be described as a building or as an underground site, for example a bridge, wall, monument, statue, free-standing chimney, or derelict building consisting only of walls.

Underground site

A human-made or natural structure that is entirely or partially underground, for example a cave, cellar, subterranean, mine, duct, tunnel, military bunker, well, or ice house.

Roost (breeding site / resting place)

The implementation of the EU Habitats Directive provides general definitions for breeding sites and resting places. For bats the two often overlap, which is why in many cases they are both referred to as roosts. Any interpretation of the terms 'breeding sites', 'resting places' and 'roosts' must take into account the prevailing conditions.

Natural England licensing guidelines (Natural England, 2011) discusses the age of roosts and mitigation requirements as well as the period of time bat roosts are protected when not used. The following is reproduced from this document.

> "Q. The development site ceased to be inhabited last year and it is prone to vandalism. I found evidence of a maternity roost but all current signs suggest that the site is now abandoned by bats. What should I mitigate for?
>
> Wildlife Advisers do not use a tightly defined period within which bat need to have used a structure beyond which it is no longer regarded as a bat roost. A structure can be regarded as a bat roost even if not knowingly occupied by bats for a year or two."
>
> The Method Statements mitigation should reflect compensation for a roost at its highest status within recent years. For example, meagre mitigation for an occasionally used, summer, non-maternity roost that had declined from a maternity roost as a result of human induced change to the roosts conditions e.g. vandalism, may not be acceptable to the Wildlife Adviser.
>
> A demolished structure, irrespective of its previous bat occupancy, clearly, ceases to be a bat roost. An intact structure without bat occupancy perhaps after a few years, and more assuredly after five years, also ceases to be a bat roost". [Emphasis added]

Natural England's guidelines are derived from the European Commission's Article 12 guidance on the definition of resting places for European Protected species.

European Commission (2007), section (54) and (59) state

> "(54) It thus follows from Article 12(1)(d) that such breeding sites and resting places also need to be protected when they are not being used, but where there is a reasonably high probability that the species concerned will return to these sites and places. If for example a certain cave is used every year by a number of bats for hibernation (because the species has the habit of returning to the same winter roost every year), the functionality of this cave as a hibernating site should be protected in summer as well so that the bats can re-use it in winter. On the other hand, if a certain cave is used only occasionally for breeding or resting purposes, it is very likely that the site does not qualify as a breeding site or resting place."
>
> (59) Resting places: a definition
>
> Resting places are defined here as the areas essential to sustain an animal or group of animals when they are not active. For species that have a sessile stage, a resting place is defined as the site of attachment. Resting places will include structures created by animals to function as resting places. Resting places that are used regularly, either within or between years, must be protected even when not occupied."

It is clear that for a site to be classified as a roost when not occupied there must have been past habitual and the probability of future use within at least a two year period as defined as "within or between years".

European Commission (2007) summaries the requirement for the protection of resting sites thus

> "Breeding sites and resting places are to be strictly protected, because they are crucial to the life cycle of animals and are vital parts of a species' entire habitat. Article 12(1)(d) should therefore be understood as aiming to safeguard the continued ecological functionality of such sites and places, ensuring that they continue to provide all the elements needed by a specific animal to rest or to breed successfully. The protection applies all year round if these sites are used on a <u>regular basis</u>." [Emphasis added]

Summary

"Breeding site"

Breeding is defined here as mating and giving birth to young. A breeding site is the area needed to mate and to give birth in, and includes the vicinity of the roost or parturition site, where offspring are dependent on such sites. For some species, breeding sites include structures needed for territorial definition and defence. Breeding sites that are used regularly, either within or between years, must be protected even when not occupied. Breeding sites include areas required for:

1. Courtship
2. Mating
3. Parturition, including areas around the parturition site when it is occupied by young dependent on that site.

Resting place

Resting places are defined here as the areas essential to sustain bats when they are not active. Resting places that are used regularly, either within or between years, must be

protected even when not occupied. Resting places essential for survival include structures and habitat features required for:

1. Thermoregulatory behaviour
2. Resting, sleeping or recuperation
3. Hiding, protection or refuge
4. Hibernation

5. RESULTS

5.1 Desk Study

A search of the Envirotech dataset returned eight records of at least four bat species within 2km but no records for the site.

Records are shown on Figure 4.

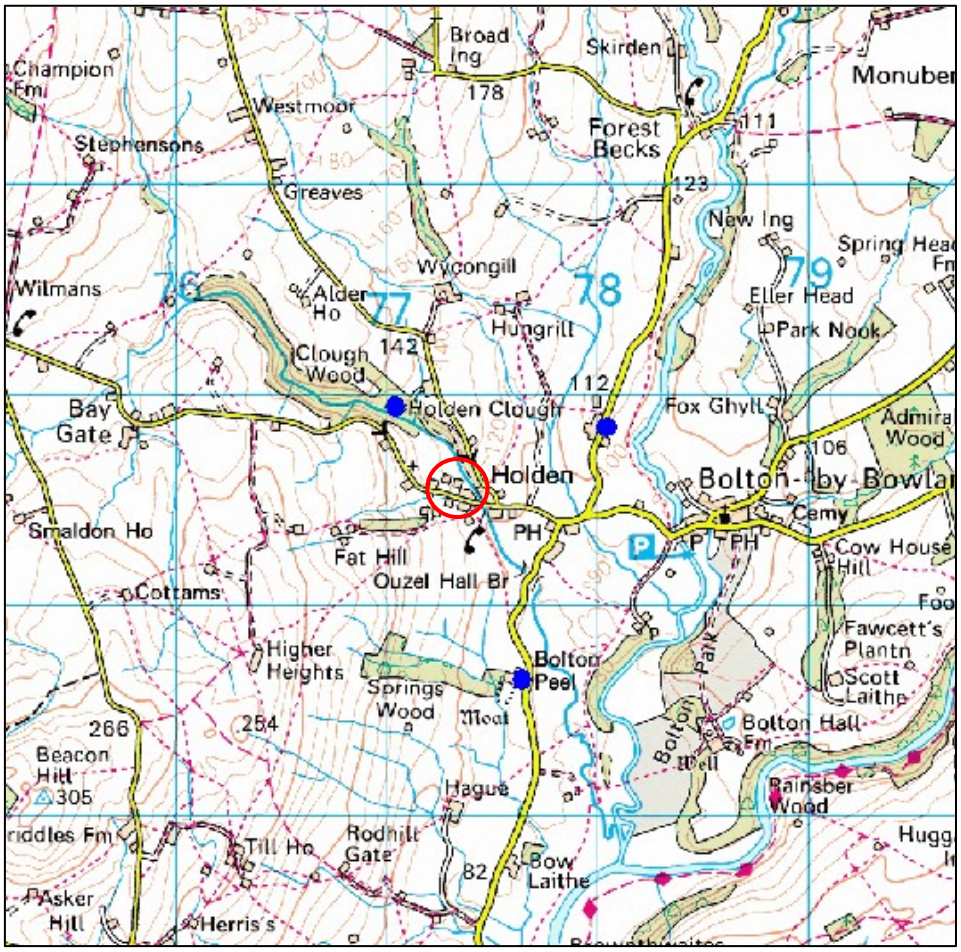


Figure 4 *Bat records shown in blue, site location circled red.*

The habitat at and adjacent to the site was assessed from satellite imagery this was then ground truthed, Figure 5.

Holden Beck and associated woodland likely to offer high quality foraging and commuting potential

Open and exposed pasture likely to offer low quality foraging opportunities

Hedgerows and fragmented woodland likely to offer moderate foraging and commuting potential

N

Key

Site Boundary

envirotech

Figure 5
Habitat

SCALE: NTS

REV 01

From the pre-existing records, a review of aerial photography, a field assessment of the area adjacent to the site and the experience of the surveyor, bat species which may occur on or adjacent to the site and the rationale for this decision are detailed in Table 4. This assessment does not look at the roosting potential of the site. The assessment of bats which are indicated as potentially occurring on the site or local area is based on the initial largely desk based scoping survey. Additional site specific assessment is provided later in this report. This assessment does however allow for the scope of site survey to be refined.

BAT SPECIES	ROOST PREFERENCE*			NICHE*	SUITABLE HABITAT		RECORDED WITHIN 2KM
	Crevice	Void	Tree		Locally	On site	
Common pipistrelle *Pipistrellus pipistrellus*	✓	×	✓	Generalist	☒	☒	☒
Soprano pipistrelle *Pipistrellus pygmaeus*	✓	×	✓	Riparian/Generalist	☒	☒	☒
Nathusius pipistrelle *Pipistrellus nathusii*	✓	×	✓	Enclosed woodland	☐	☐	☐
Brown long-eared *Plecotus auritus*	×	✓	✓	Enclosed woodland	☐	☐	☐
Whiskered *Myotis mystacinus*	✓	✓	✓	Linear vegetation	☒	☒	☒
Brandt's *Myotis brandtii*	✓	✓	✓	Linear vegetation	☒	☒	☒
Natterer's *Myotis nattereri*	×	✓	✓	Enclosed riparian	☒	☒	☐
Daubenton's *Myotis daubentonii*	✓	×	✓	Open aquatic	☐	☐	☒
Alcathoe's *Myotis alcathoe*	×	×	✓	Enclosed woodland	☐	☐	☐
Noctule *Nyctalus noctula*	×	×	✓	Above woodland/water	☒	☒	☒

Table 4 *Bat species whose geographical range extends to the region in which the site is located. *Typically but not exclusively.*

5.2 Field Survey

5.2.1 Habitat Description

The habitat on and adjacent to the site identified from satellite images was ground truthed. Details of the habitats found on and adjacent to the site are detailed in Figure 5.

It is judged that the most suitable commuting route for bats into and out of the site is the tree-lined Holden Beck running adjacent to the east of the site. The surrounding habitat is considered to have moderate-high foraging potential.

The site is considered to offer moderate foraging opportunities. There are large areas of hard standing, but also considerable vegetative diversity due cultivation of garden plants. The site is in a sheltered position.

5.2.2 Bat Roost Survey

5.2.2.1 General description

There are three buildings on site which comprise a bungalow, tearoom and potting shed.

5.2.3 Building 1 - Bungalow

5.2.3.1 External walls/ Eaves

The walls of the building are made from natural stone and wood panelling and are in excellent condition. There are no structural gaps or cracks, the pointing between the stone is in excellent condition. A horizontal gap is however present between the wood panelling near the apex of the west gable.

The timber fascia and soffits around the wall tops of the building are in a poor condition and there are numerous splits and crevices which could allow bat access.

Despite the apparent opportunities, no evidence of use of the walls by bats was recorded on the exterior walls of the building. The walls were considered to offer bats **moderate** roosting potential because of the fascia and soffit gaps.

5.2.3.2 Roof

The roof of the building is made from concrete interlocking tiles. There is plentiful moss on the roof, particularly on the east end of each roof pitch, close to the boundary woodland. The tiles are all in position and there do not appear to be any suitable gaps or raised slates where bats could gain entry.

The ridgeline is all mortared in place and there are no gaps under ridge tiles.

Where the chimney meets the roof on the south pitch gaps exist under the lead flashing. The full extent of the gaps could be seen from the ground with close focus binoculars and a 1,000,000 candle power torch.

No evidence of use of the roof by bats could be seen, but given the gaps in the flashing it was considered that the roof could offer a **moderate** potential for use by bats.

5.2.3.3 Internal walls

The internal walls of the bungalow are unavailable to roosting bats as they form part of the residence.

5.2.3.4 Roof Voids/ Roof structure

The roof is felt lined and this has torn in several places. Droppings (50-150) of mixed age spill through from a tear at the apex towards the west elevation of the building. A sample of these droppings was collected and sent away for DNA analysis, the results are appended. The remainder of the void shows little physical signs of use by bats.

The timbers are thin and modern and remain in good condition. There are no signs of use by bats on either of bare block gable walls at either end of the building.

Past and/or current use of the roof void/roof structure by bats was confirmed.

5.2.3.5 Summary

To summarise the small building has gaps in the timber wall panelling externally and in the fascia and soffits. Bat droppings were present in the roof void spilling through from a rip in the felt and bats were heard between the felt and the roof tiles. **Bats were confirmed present in the roof structure of this building.**

5.2.4 Building 2 - Tearoom

5.2.4.1 External walls/ Eaves

The walls of the building are made from ashlar and are in excellent condition. There are no structural gaps or cracks, the pointing between the stone is in excellent condition.

There are no soffit or eaves boards, but small gaps do are present behind guttering over the wall tops.

Small numbers of bat droppings were found on windowsills below the eaves on the south elevation.

The walls were considered to be well sealed with only **negligible** potential for use by bats. Droppings on windowsills could not be correlated with any potential roost sites.

5.2.4.2 Roof

The roof of the building is made from slate and appeared well sealed, with the majority of slates in place and laying flat.

Where the chimney meets the roof above the north gable there are very small gaps beneath lead flashing and there are some verge gaps between slates but these are very tight.

All ridge tiles are in places and appear to fit tightly and there are no gaps for bats to utilise along

the ridgeline.

The roof appeared to offer a **low** potential for use by roosting bats. There was no evidence to suggest roosting bay bats in the roof.

5.2.4.3 Internal walls

The internal walls of the building are unavailable to roosting bats as they form part of the busy tearoom.

5.2.4.4 Roof Voids/ Roof structure

The roof voids are large but cluttered with complicated roof joists. The roof is lined and with a modern breathable membrane but the space is hot inside. There was no evidence anywhere to suggest any type of use by bats, the void was very clean. It was considered that this roof void offers **negligible** potential for use by bats.

5.2.4.5 Summary

To summarise this large building is in very good condition and well sealed except small gaps under flashing on the gable wall tops around chimneys and some small verge gaps. Droppings on window sills and walls outside did not correlate with any potential roost locations. It was considered the building offers only **low** potential for use by bats for roosting.

5.2.5 Building 3 – Potting Shed

5.2.5.1 External

The walls are constructed from brick and these have mostly been rendered which means they are well sealed. The wall tops mate tightly to the timber roof leaving no gaps. The timber roof structure has overhanging eaves boards that leave gaps but the space between these and the walls is often too large to be of interest to bats.

The timber roof was originally felted but appears to have had sedum added and a mix of bryophytes also grows here. Much of the felt appears to have deteriorated and the roof is now somewhat dilapidated. There are no areas that appear to be suitable for use by bats.

We consider the external areas of this building to offer **negligible** potential for use by bats and there was no evidence to suggest use.

5.2.5.2 Internal

The inside of the potting shed is a regularly disturbed space with a low ceiling. There are no roof voids and no areas which are accessible to bats and would also offer gaps, crevices or voids suitable for use by roosting bats. There was no evidence of use of the interior by bats and it was considered that this area offers negligible potential for use by bats.

5.2.6 First Activity Survey 31st May 2018

During the activity survey two soprano pipistrelle bats were recorded emerging from flashing high on the west side of the chimney on the north gable of the Tearoom shortly after sunset. These bats remained on site to forage for the duration of the survey. Common pipistrelles were also recorded foraging around the site from 25 minutes after sunset but did not originate from site.

A single Whiskered/Brandt's bat was recorded foraging around the site some 45 minutes after sunset.

No bats were recorded emerging from either the Bungalow or the Potting Shed.

The survey was terminated when light levels reached 0.2 Lux and seeing bats became difficult.

Bat activity is plotted on Figure 6.

5.2.7 Second Activity Survey 12th July 2018

Again two soprano pipistrelle bats were recorded emerging from a wall top location high on a gable wall of the Tearoom shortly after sunset, this time a verge gap high on the west gable wall top.

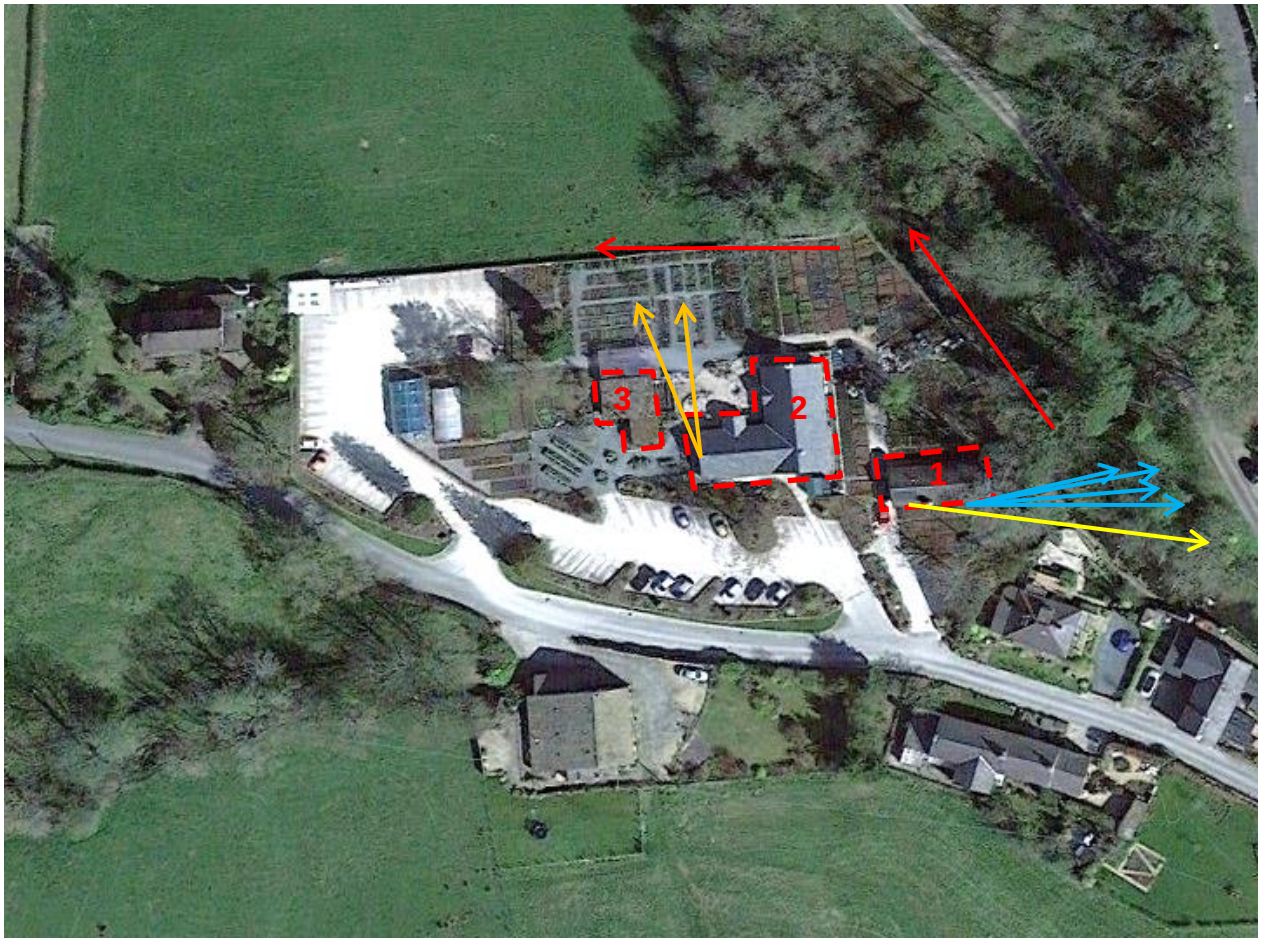
A single Whiskered/Brandts bat was recorded emerging from under flashing on the south-west edge of the chimney on the south elevation of the Bungalow.

Four Natterer's bats were recorded emerging from a gap in the timber of the porch structure on the south elevation of the bungalow at ~55 minutes after sunset.

No other bats were recorded emerging from the site and the survey was terminated 90 minutes after sunset.

Bat activity is plotted on Figure 7.

Figure 6
Bat Activity



Key

Site Boundary

Common Pipistrelle

Soprano Pipistrelle

Whiskered /Brandt's

Natterer's

N

envirotech

Figure 7
Bat Activity

SCALE: NTS

REV 01

6. CONSTRAINTS

We judge that the site survey is sufficient to address the risk to bats at the site based on the species present in the local area, construction of the buildings and nature of the proposed work. The level of survey effort accords with the recommendations of Collins ed. (2016). The reasonable probable use of the site by bats has been determined.

7. INTERPRETATION

7.1 Presence / absence

There were bats recorded roosting in both the Tearoom and the Bungalow at the site. Droppings inside the building were confirmed as those of Natterer's bats.

7.2 Population size class assessment

A maximum of 7 bats were recorded roosting on site.

7.3 Site status assessment

We consider the site is used by non-breeding bats for transitional/day roosting.

8. POTENTIAL IMPACTS

8.1 Bat Roosts

8.1.1 Pre and mid-activity impacts

A worst case scenario will be considered in addressing potential impacts at the site without mitigation.

8.1.1.1 Maternity Roosts

No signs of past maternity or gathering roosts were found at the site during the survey. The potential for a maternity or gathering roost in the buildings is judged to be very low due to the absence of highly suitable roost sites. Evidence of past use of the site by large numbers of bats such as would occur in a maternity or gathering roost, such as staining on the roof or walls, was absent. Evidence of intensive/ regular use such as occurs in such roosts can usually be found at any time of year. **We judge there is no risk to a maternity colony or gathering roost at this site from the proposed work.**

8.1.1.2 Satellite Roosts

We do not consider that satellite roosts will be affected by the proposal. There was no indication of elevated use of the site such as would occur if this roost type were present. **We judge there is no risk to a satellite roost at this site from the proposed work.**

8.1.1.3 Transitional and day roost sites

We judge there is a low risk of a significant disturbance to bats in or loss of or alteration of transitional or day roost sites. Four separate transitional/day roosting sites were recorded at the site. There are currently no plans to directly disturb any of the areas were bats were recorded roosting. The numbers of bats present is low, the species is common. The bungalow is entirely unaffected by the proposals. There is an existing elevated level of human activity around the site due to its current use. Construction works are unlikely to increase this level of disturbance.

8.1.1.4 Night Roosts

We do not consider the site is sufficiently close to or linked with high quality foraging habitat such that bats may use it for night roosting.

8.1.1.5 Feeding roosts

We do not consider the site is sufficiently close to or linked with high quality foraging habitat such that bats may use it for feeding roosts.

8.1.1.6 Lek sites

In our experience lek sites are commonly found in proximity to the main feeding and commuting routes. The primarily commuting and feeding area at the site was judged to be the woodland some distance from the site to the West. There were no potential lek sites identified in the buildings facing this commuting route which are also close enough to it to be

used by male bats for leks. It is therefore unlikely there will be use of the buildings by bats for lekking.

8.1.1.7 Hibernation

There are no areas of rotten wood in the buildings or damp walls which also offer crevices which could be suitable for hibernating *Pipistrelle* spp. bats.

There are no areas of the buildings which are sufficiently damp, cool and darkened which would be ideal for hibernating *Myotis* spp. bats. There is very little evidence and limited potential for hibernation at the site; it is therefore unlikely there will be loss of hibernation sites.

8.1.1.8 Swarming

There is unlikely to be any loss of a swarming site. Swarming sites are generally found at or near hibernation sites. We judge that the site is unlikely to be used by *Myotis* spp. bats and brown long-eared bats which have been known to swarm as there are no hibernation sites for these species in the buildings.

8.1.1.9 Summary

Without mitigation, there is considered to be only a low potential for the alteration or loss of occasional, unconfirmed roost sites for bats at the site and this is unlikely to have a significant impact on their local distribution. Identified roosts are not affected by the proposals.

8.1.2 Long term impacts

There is on balance a low risk of long term negative impacts on the favourable conservation status of bats in the local area as a result of the proposed work.

8.1.3 Post activity interference impacts

There is unlikely to be disturbance to roosting bats during the post construction phase of the project. There is already significant disturbance at the site from existing use of the site and surrounds.

8.1.4 Other impacts

It is our opinion that there will be no significant other negative impacts relating to the proposed work which may affect bat species.

8.1.5 Bat Foraging and Commuting Habitat

There is unlikely to be a disruption to any commuting routes at the site. The site does not lie on or near to a high quality commuting route.

There is unlikely to be a disturbance to feeding bats during and after the construction phase of the project. It is judged that the foraging areas near the site will be unaffected by the proposed work.

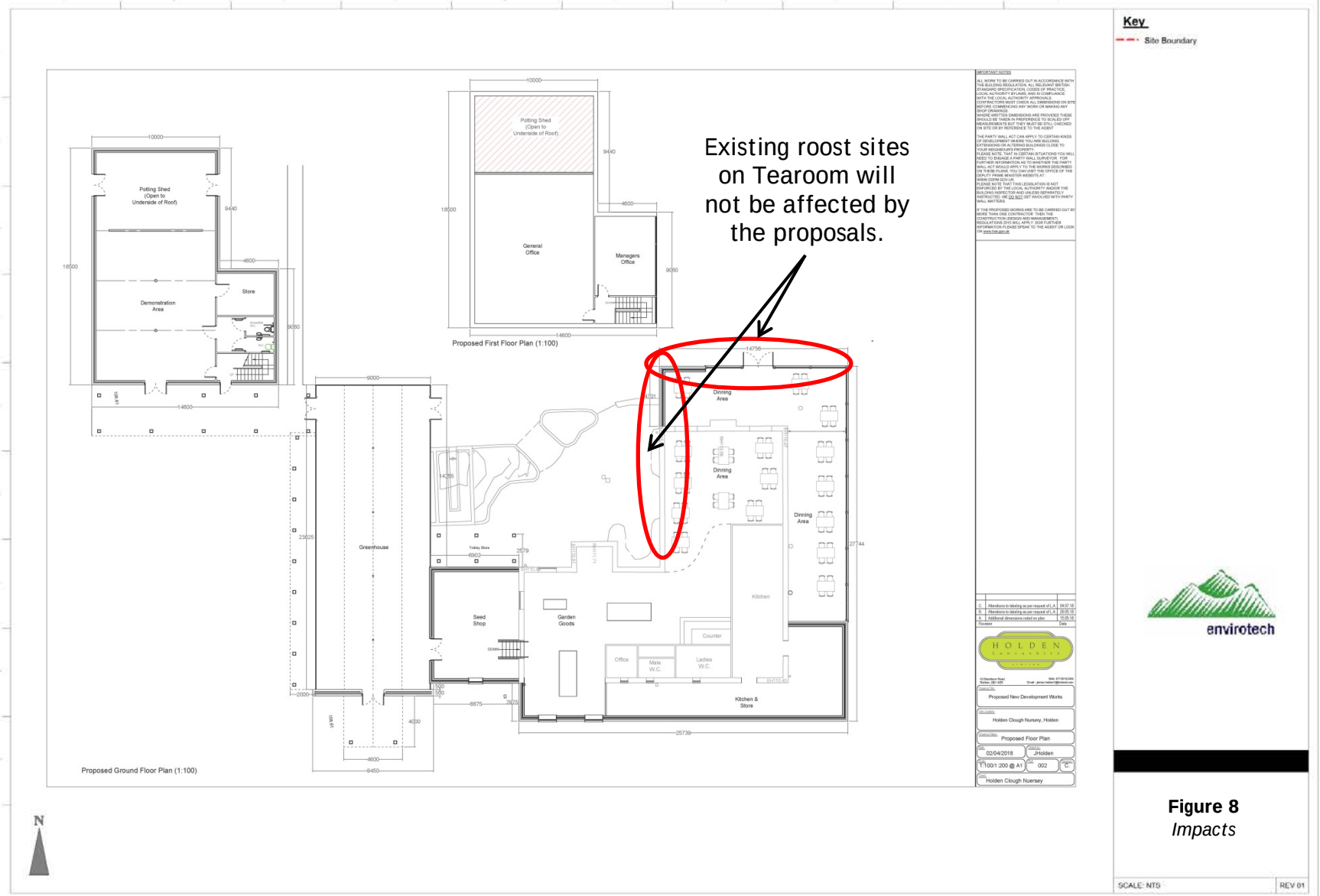


Figure 8
Impacts

SCALE: NTS | REV 01

9. RECOMMENDATIONS AND MITIGATION

9.1 Further Survey

We consider that the risk to bats in the buildings will remain low and no additional survey work is required prior to the determination of the planning application.

9.2 Mitigation Measures

9.2.1 Bats

Natural England requires that mitigation addresses the impacts picked up by the site assessment, as follows:-

- Quantitative characteristics: There should be no net loss of roost sites, and in fact where significant impacts are predicted there will be an expectation that compensation will provide an enhanced resource compared with that to be lost. The reasoning behind this concept is that the acceptability of newly created roosts by bats is not predictable.

- Qualitative characteristics: the plans should aim to replace like with like. As an extreme example, it would be unacceptable to replace maternity roosts with hibernation sites.

- Functional characteristics: compensation should aim to ensure that the affected bat population can function as before. This may require attention to the environment around the roost.

Natural England also recommends that precautions are taken to avoid the deliberate killing or injury of bats during development work at the site.

The site survey found no evidence of habitual use of the buildings by roosting bats in or between years, although there is a possibility of a low level of opportunistic use at some times of the year. The survey effort was sufficient to allow for an assessment of this to be made.

9.2.1.1 Bat Roosts

As a precautionary approach the following guidelines will be adhered to.

1. All contractors on the site will be made aware of the possible presence of bats prior to the commencement of work and location of identified roosts.

2. Contractors will be provided with the contact details of an appropriately qualified individual who can provide advice in relation to bats at any time during work. In the event that bats are found during work, unless the action has already been cleared by a suitably qualified individual, **all work will cease** and an appropriately qualified individual will be contacted for further advice.

3. Contractors will be observant during demolition work for bats which may use the buildings if new areas of the roof are exposed and left open overnight. Bats are opportunistic and may make use of gaps opened up during work overnight.

4. If it is necessary to remove a bat to avoid it being harmed, gloves should be worn. It should be carefully caught in a cardboard box and kept in the dark in a quiet place until it can be released at dusk near to where it was found, or moved to an undisturbed part of the building, with outside access, and placed in a location safe from predators.

5. **If bats or bat roosts are found during work, all work should cease**. The site will need to be re-assessed in regard to its use by bats. A Natural England licence may be required if continuing work is, on balance, likely to result in the disturbance, killing or injury of bats or the alteration, destruction or obstruction of roost site.

6. Remove all roof coverings by hand only.

7. Retain existing confirmed roosts untouched. A licence will be required if these areas are disturbed in any way.

8. There is no need to restrict the timing of work. Use of the structure by bats is equally likely to occur at any time of the year but will be at low levels.

9. Consider erecting west or south-west facing bat boxes in suitable places around the site.

Following English Nature (Natural England) guidance Mitchell-Jones (2004), if these guidelines are followed we would consider that on balance, a disturbance to bat species which could be contrary to the 2017 Habitat Regulations and Wildlife and Countryside Act (1981) (as amended) is unlikely. **If bats are found prior to or during work a licence application may be required.**

9.2.1.2 Mitigation for Foraging and Commuting Habitat

No specific mitigation for foraging and commuting habitat is necessary. The habitat surrounding the site does not change significantly.

9.2.1.3 Requirement for Habitats Regulations (EPS) Licence

At this stage, we judge that a Natural England licence will not be required to cover work on the buildings. Bats were confirmed as roosting at the site however the loss of roost sites will be avoided and no significant disturbance to bats will occur, so long as the recommendations of this report are followed.

If bats are likely to be significantly disturbed or further bat roosts or breeding sites are found as a result of work, all work must cease and the site will need to be re-assessed by a suitably qualified person with regard to its use by bats. A Natural England licence may be required if continuing work is, on balance, likely to result in the disturbance, killing or injury of bats or the alteration, destruction or obstruction of a roost or breeding site.

10. MITIGATION SUMMARY

The site survey found bats roosting in several areas of the site although all in places that will not be affected by the proposals. Construction workers will be informed of the presence of bats prior to the commencement of works, precautionary mitigation will be utilised during any demolition and construction at the site so that a significant disturbance and/or the loss of roost sites is unlikely to occur.

On the basis of survey information, specialist knowledge of bat species and the mitigation that has been proposed, it is considered that on balance the proposed activity is reasonably unlikely to result in an offence under regulation 39 of the Conservation (Natural Habitats, &c.) Regulations (2017). We do not consider there to be a need for a Natural England licence at this time.

11. REFERENCES

Information from the following sources has been used in preparing the survey report.

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APPENDIX 1 PHOTOGRAPHS

	**Building 1 is a bungalow that is not included in the current proposals but may be developed in future. A Whiskerd/Brandt's bat (yellow arrow) and four Natterer's bats (blue arrow) were recorded emerging from the building.**
	**Building 1** **Par of the bungalow is clad with timber. The roof is well sealed.**
	**Building 1** **There is a large vent in the timber cladding that would allow bats free access but shows no signs of use.**

	**Building 1** **There are droppings leaking into the roof void from a rip in the roofing felt. These were DNA tested and came back as Natterer's bat droppings.**
	**Building 2** **Two soprano pipistrelles were recorded emerging from a flashing gap on during the first survey at the site. Two soprano pipistrelles also emerged from a similar place on a different gable during the second survey.**
	**Building 2 is otherwise very well sealed.**

The roof void of building 2 was found to be very clean.

Building 3

The potting shed was considered to offer negligible potential for use by roosting bats. There were no areas that appear to offer suitable roosting opportunities.

WARWICK
THE UNIVERSITY OF WARWICK

EcoWarwicker
Ecological Forensics

21 June 18

Re: Identification Results for Andrew Gardner, Envirotech

Job number 11939, received 07 June 2018
Sample labelled: 4669 Holden Clough 31/5/18
PCR amplification successful. DNA sequence:
ATGACCAACATTCGAAAGTCTCACCCCCTAATGAAAATTATCAATAACTCCTTTATTGA
CCTACCCGCTCCATCAAATATCTCTTCCTGATGGAATTTCGGATCTCTTTTAGG

Phylogenetic analysis identification: *Myotis nattereri*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

Professor Robin Allaby

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