

ECOLOGICAL APPRAISAL AND BAT SURVEY

EVISTONES COTTAGE, ROCHESTER



FEBRUARY
2019
FINAL

E3 ECOLOGY LTD
PASTURE HOUSE, WARK, HEXHAM, NORTHUMBERLAND, NE48 3DG
01434 230982
WWW.E3ECOLOGY.CO.UK
MAIL@E3ECOLOGY.CO.UK

CLIENT Mr Pritchard
PROJECT NAME Land adjacent to Evistones House
PROJECT NUMBER 5580

LEAD AUTHOR Taryn Rodgers
POSITION Ecologist
CONTACT DETAILS taryn.rodgers@e3ecology.co.uk

APPROVED BY Mark Osborne
POSITION Associate Director
CONTACT DETAILS Mark.Osborne@e3ecology.co.uk

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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
Common pipistrelle	E3 Ecology	July 2018	NY 83 96	17	Maternity roost
Soprano pipistrelle	E3 Ecology	July 2018	NY 83 96	29	Maternity roost
Natterer's	E3 Ecology	July 2018	NY 83 96	1-2	Day roost, confirmed by DNA analysis
Brandt's	E3 Ecology	July 2018	NY 83 96	1-2	Day roost, confirmed by DNA analysis
Noctule	E3 Ecology	July 2018	NY 83 96	1	Commuting/foraging

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A. SUMMARY

E3 Ecology Ltd was commissioned by Michael Hall Associates on behalf of Mr Pritchard to undertake an ecological appraisal (EA) and bat surveys of land at Evistones House and Cottage, Rochester.

It is proposed to demolish three buildings including Evistones Cottage, garage and kennel building, and an adjacent small shed building. The intention is then to construct a multiple garage block with storage and a new building to replace Evistones Cottage. Evistones House will not be modified within the development and is therefore considered outside the scope of this report.

No statutorily designated sites are present within 2km of the survey area. The site lies within Northumberland National Park, and within a Site of Special Scientific Interest Impact Risk Zone. However, the risk zone does not relate to residential development, and the proposed development is considered to have a negligible impact on habitats within the national park. There is a single non-statutory site, Tow Law Wood, within 500m of the site. As the proposed development is replacing existing buildings with an increase of use of likely no more than 2-4 people, a negligible impact is expected on this single non-statutory site.

The habitat within the direct development footprint is predominantly buildings, hardstanding, poor semi-improved grassland and amenity grassland considered to be of low value. However, it also includes a small amount of semi-natural broadleaved woodland to the northwest and semi-improved neutral grassland with bracken to the south, considered to be of local value. The three buildings include Evistones Cottage, a Kennels and Garage, and the Shed. Roof voids are present in all except the Shed, and they are all of stone construction.

The preliminary appraisal of the buildings identified confirmed roosts within the Kennel and Garage and Evistones Cottage, with bat droppings within roof voids and externally under bargeboards and similar features. DNA analysis of droppings confirmed the presence of common pipistrelle, soprano pipistrelle, Natterer's and Brandt's bats. Bats were also heard calling within the Kennel and Garage loft void. These buildings are of high suitability for roosting bats. The shed is of moderate suitability to support roosting bats.

There is low potential for badger, hedgehog and reptiles to be present commuting and, in the case of reptiles basking, within the direct development footprint. If present, the development footprint is considered to be of low value to these species, which are more likely to be present within the wider site ownership boundary. The buildings to be demolished are of local value to nesting birds, with swallow and house martins nesting on site, and the potential for nesting passerine birds within crevices and jackdaws within loft voids. The shed and Evistones Cottage are considered suitable for barn owl. No signs of barn owl such as pellets were found on site, and no barn owls were observed during the bat activity surveys. This species is therefore considered likely to be absent from site. *Montbretia*, an invasive plant species, was recorded within the direct development footprint.

As all waterbodies within 500m of the site were dry with 100% vegetation cover, it is considered that these are dry most years and great crested newt are therefore likely absent from the site.

The two dusk vantage point surveys on 04 July 2018 and 31 July 2018 identified roosts on all three buildings, including:

- Small soprano and common pipistrelle maternity roosts, and two *Myotis* sp. (including Natterer's and Brandt's bats) day roosts within the Kennels and Garage (peak counts 24, 17 and 1 each respectively).

- Small soprano and common pipistrelle maternity roosts and a *Myotis* sp. (including Natterer's and Brandt's bats) day roost in Evistones Cottage (peak counts 8, 10 and 1 each respectively).
- An occasionally used day roost on the shed (species likely to be Natterer's, Brandt's or pipistrelle sp. based on surrounding activity, peak count 1).

Survey has confirmed that the site supports small soprano and common pipistrelle maternity roosts, which are considered likely to be linked and moving between Evistones Cottage, the Kennels and Garage and possibly also Evistones House, depending on weather conditions and potential parasite loads. The buildings also have potential to be used as a hibernation roost, and to be used as a day roost by soprano pipistrelles, common pipistrelles, Natterer's and Brandt's bats. The site overall is considered to be of at least parish value for bats.

No other priority or notable species are considered likely to be impacted by the proposed development.

Potential impacts of the development are:

- Loss of small maternity roosts used by common and soprano pipistrelles of parish value.
- Loss of Natterer's and Brandt's bats day roosts, and potentially soprano common pipistrelle and common pipistrelle day roosts of local value.
- Loss of buildings with potential as a bat hibernation roost.
- An increase in disturbance to bats due to increasing lighting levels.
- Loss of nesting opportunities, and potential destruction of nests, for swallows, house martins and potentially other passerine birds utilising the buildings.
- Loss of buildings with potential to support barn owl.
- Potential entrapment of mammals including badgers and hedgehogs through any excavation works.
- Potential harm to reptiles which may utilise small areas of semi-improved grassland and amenity grassland within the development footprint.
- Loss of a small area of amenity, poor semi-improved grassland, buildings and hardstanding of low value.
- Loss of a small amount of semi-natural broadleaved woodland to the northwest and semi-improved neutral grassland with bracken to the south, considered to be local value.
- Potential spread of the invasive plant species *Montbretia*.

Key mitigation measures include:

- Works shall not commence until a Natural England licence is in place, and works will be undertaken to a method statement detailing specific working methods with regard to bats.
- Bat boxes, external crevice roost sites, swallow platforms and artificial house martin nests will be incorporated into the proposed development design.
- External lighting that may reduce bat use of potential roost sites (retained and/or new) will be avoided.
- Demolition of the buildings and vegetation clearance will be undertaken outside of the bird nesting season (March to August inclusive) unless a checking survey by a suitably experienced ornithologist confirms the absence of active nests (including a check for barn owl).
- Any excavations left open overnight will have a means of escape for mammals that may become trapped in the form of a ramp at least 300mm in width and angled no greater than 45°.

- The invasive species *Montbretia* should be removed under contractor method statement.
- All vegetation within the development footprint will be strimmed short during the active reptile season (April to September) and all arisings shall be removed from the site. Building materials should be stored on hardstanding or on raised pallets to minimise the risk of creating wildlife refugia.
- All works should be undertaken within a minimum easement and avoid disturbance of any habitats outside the direct development footprint.
- Works be undertaken under a precautionary method statement for reptiles.

The local planning authority is 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.

Before this report can be used to support a planning application it is recommended that:

- Mitigation proposed in this report is incorporated into the architect's plans that support the planning application including design details of bat access routes.

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

B. INTRODUCTION

E3 Ecology Ltd was commissioned by Michael Hall Associates on behalf of Mr Pritchard to undertake an ecological appraisal (EA) and bat surveys of land at Evistones House and Cottage, Rochester

The purpose of this report is:

- To identify and describe all potentially significant ecological effects associated with the proposed development; and
- To set out any further ecological survey work required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects.

The site is located at Evistones House, Rochester at an approximate central grid reference of NY 83318 96670. The site location is illustrated in the figure below.

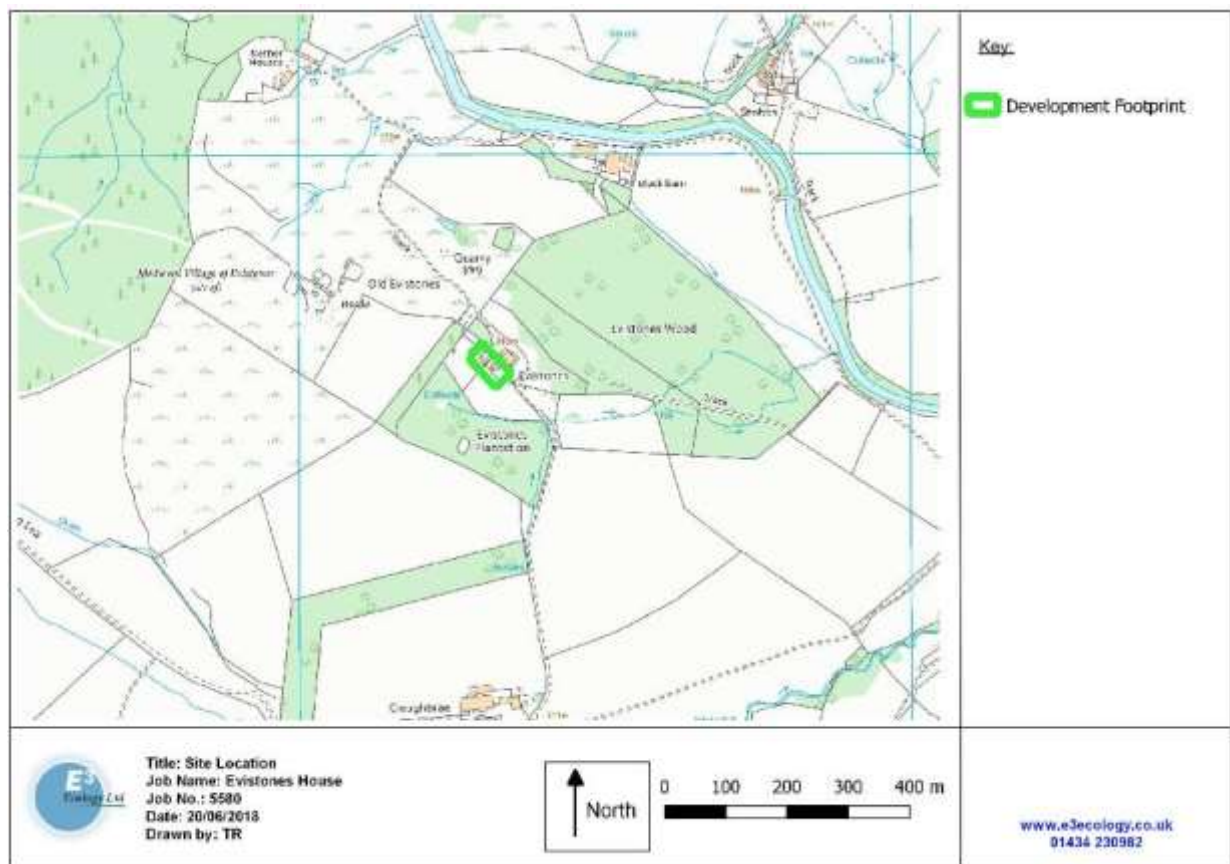


FIGURE 1: SITE LOCATION

(OS mapping © Crown copyright and database rights 2016/2017 OS 0100039392)

It is proposed to demolish three buildings including Evistones Cottage, garage and kennel building, and a small shed building adjacent. The intention is then to construct a multiple garage block with storage and a new building to replace Evistones Cottage. Evistones House will not be modified within the development and is therefore considered outside the scope of this report. The direct footprint of the proposed development is approximately 0.22ha.

Proposed development proposals are shown in the figure below:

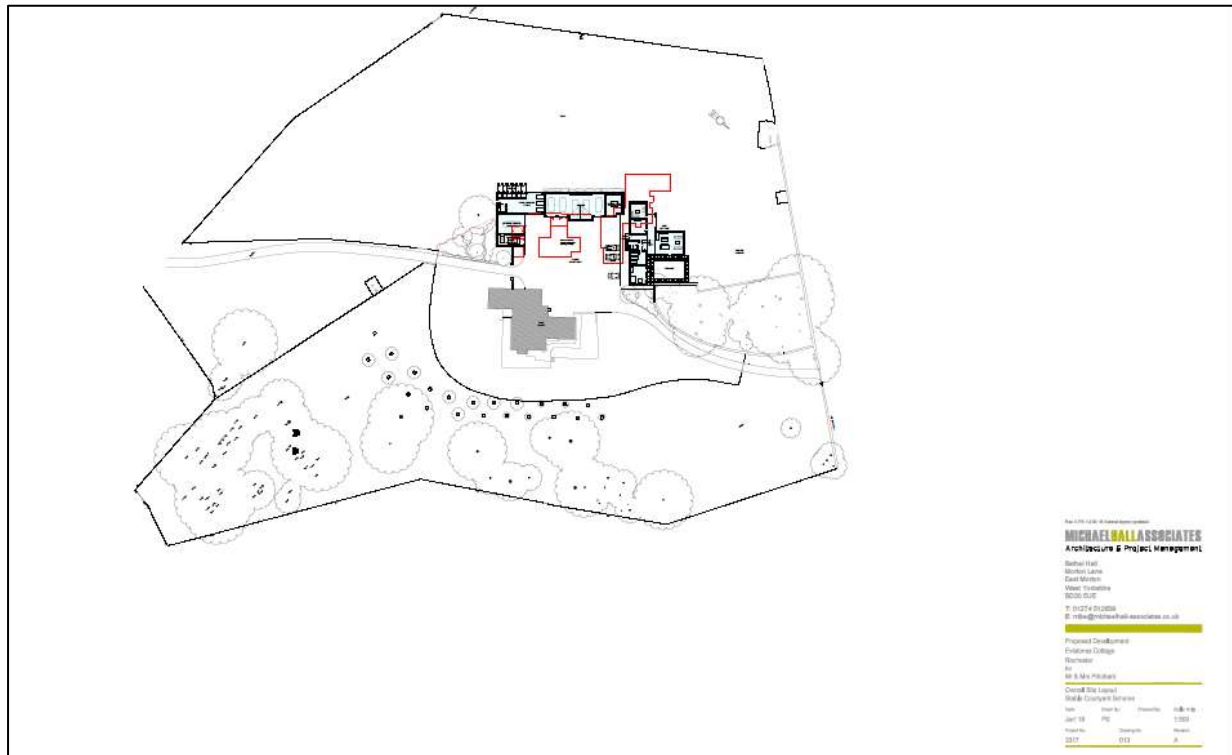


FIGURE 2: DEVELOPMENT PROPOSALS (RED BUILDINGS TO BE DEMOLISHED, BLACK BUILDINGS PROPOSED)¹

¹ Michael Hall Associates (Jan 2018). *Proposed Development Evistones Cottage Rochester for Mr & Mrs Pritchard*. 3317 013 A.

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: 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 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.	171
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:	174

² National Planning Policy Framework (July 2018), Ministry of Housing, Communities and Local Government

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.

<p>a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity⁶; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation⁷; and</p> <p>b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.</p>	
<p>When determining planning applications, local planning authorities should apply the following principles:</p> <p>a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;</p> <p>b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;</p> <p>c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons⁸ and a suitable compensation strategy exists; and</p> <p>d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.</p>	175
<p>The following should be given the same protection as habitats sites:</p> <p>a) potential Special Protection Areas and possible Special Areas of Conservation;</p> <p>b) listed or proposed Ramsar sites⁹; and</p> <p>c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.</p>	176
<p>The presumption in favour of sustainable development does not apply where development requiring appropriate assessment because of its potential impact on a habitats site is being planned or determined.</p>	177

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

Planning Practice Guidance¹⁰ states:

- *'The National Planning Policy Framework is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution' (para. 007).*
- *'Information on biodiversity impacts and opportunities should inform all stages of development An ecological survey will be necessary in advance of a planning*

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.

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)

application if the type and location of development are such that the impact on biodiversity may be significant and existing information is lacking or inadequate’ (para. 016).

- *‘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’ (para. 016).*
- *‘Local planning authorities should only require ecological surveys where clearly justified, for example if they consider there is a reasonable likelihood of a protected species being present and affected by development. Assessments should be proportionate to the nature and scale of development proposed and the likely impact on biodiversity’ (para. 016).*
- *‘Biodiversity enhancement in and around development should be led by a local understanding of ecological networks, and should seek to include:*
 - *habitat restoration, re-creation and expansion;*
 - *improved links between existing sites;*
 - *buffering of existing important sites;*
 - *new biodiversity features within development; and*
 - *securing management for long term enhancement’ (para. 017).*

C.2 PROTECTED SPECIES LEGISLATION

The table below details the relevant legislation for those protected species that may be present on this site.

TABLE 2: SUMMARISED SPECIES LEGISLATION		
Species	Relevant Legislation	Level of Protection
Bats (All species)	<ul style="list-style-type: none"> Protection under the Wildlife and Countryside Act (WCA) (1981) (Listed on Schedule 5) - as amended Classified as European protected species under Conservation of Habitats and Species Regulations 2017 Bats are also protected by the Wild Mammals (Protection) Act 1996 	<p>The WCA (1981) and Conservation of Habitats and Species Regulations 2017 make it an offence to:</p> <ul style="list-style-type: none"> Intentionally kill, injure, or take any species of bat Intentionally or recklessly disturb bats Intentionally or recklessly damage destroy or obstruct access to bat roosts
Red Squirrel	<ul style="list-style-type: none"> Full protection under the Wildlife and Countryside Act (WCA) (1981) (Listed on Schedule 5) - as amended Red squirrels are also protected by the Wild Mammals (Protection) Act 1996 	<p>The WCA (1981) makes it an offence to:</p> <ul style="list-style-type: none"> intentionally kill, injure, or take red squirrels intentionally or recklessly damage destroy or obstruct access to any place used by the animal for shelter or protection or disturb red squirrels whilst they are using such a place.
Birds	<ul style="list-style-type: none"> Protection under the Wildlife and Countryside Act (1981) as amended with the exception of some species listed in Schedule 2 of the Act 	<p>The WCA (1981) makes it an offence to (with exceptions for certain species):</p> <ul style="list-style-type: none"> Intentionally kill, injure or take any wild bird Intentionally take, damage or destroy nests in use or being built (including ground nesting birds) Intentionally take, damage or destroy eggs Species listed on Schedule 1 of the WCA or their dependant young are afforded additional protection from disturbance whilst they are at their nests
Badger	<ul style="list-style-type: none"> Protection of Badgers Act 1992 Badgers are also protected by the Wild Mammals (Protection) Act 1996 	<p>The Protection of Badgers Act (1992) makes it an offence to intentionally or recklessly:</p> <ul style="list-style-type: none"> Damage a badger sett or any part of it Destroy a badger sett Obstruct access to, or any entrance of a badger sett Disturb a badger whilst it is occupying a badger

TABLE 2: SUMMARISED SPECIES LEGISLATION

Species	Relevant Legislation	Level of Protection
		sett
Common reptiles (Slow-worm, Adder, Grass Snake, Common Lizard)	<ul style="list-style-type: none"> Partially protected by the Wildlife and Countryside Act 	<p>The WCA (1981) makes it an offence to:</p> <ul style="list-style-type: none"> intentionally kill or injure these animals Sell, offer for sale, advertise for sale, possess or transport for the purposes of selling any live or dead animals or part of these animals
<p><i>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 damaging a place of shelter or disturbing those species given full protection under the act is extended to cover reckless damage or disturbance.</i></p>		

C.3 INVASIVE SPECIES LEGISLATION

The table below details the legislation in relation to invasive species and lists those invasive species most likely to be found in this region.

TABLE 3: SUMMARISED INVASIVE SPECIES LEGISLATION

Relevant Legislation	Description of Offence	Species (Covered by the Legislation and most likely to be found in this Region)
Listed on Part II of Schedule 9 of the Wildlife and Countryside Act (1981 as amended)	<p>Section 14 of the WCA (1981) states:</p> <ul style="list-style-type: none"> if any person plants or otherwise causes to grow in the wild any plant which is included in Part II of Schedule 9, he shall be guilty of an offence. 	<p>Himalayan balsam Cotoneaster Montbretia Japanese knotweed Giant hogweed Rhododendron</p>

C.4 WILDLIFE SITE POLICY AND LEGISLATION

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

C.5 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 table below details the local biodiversity action plan relevant to the area within which this site lies, and the species/species groups and habitats listed as priorities within the plan.

TABLE 4: NORTHUMBERLAND BIODIVERSITY ACTION PLAN

Species			Habitats		
Barn Owl	Bats	Black Grouse	Blanket Bog	Built Environment	Brownfield Land
Coastal Birds	Common Seal	Dingy Skipper	Calaminarian Grassland	Coastal heathland	Fen, Marsh & Swamp
Dormouse	Farmland Birds	Freshwater Fish	Gardens & Allotments	Heather Moorland	Lowland Heathland
Freshwater Pearl Mussel	Garden Birds	Great Crested Newt	Lowland Meadows & Pastures	Maritime Cliffs & Slopes	Native Woodland
Grey Seal	Hedgehog	Otter	Ponds, Lakes &	Recreational &	Reedbed

TABLE 4: NORTHUMBERLAND BIODIVERSITY ACTION PLAN

			Reservoirs	Amenity Space	
Red Squirrel	River Jelly Lichen	Upland Waders	Rivers & Streams	Rocky Shore, Reefs & Islands	Saline Lagoons
Violet Crystalwort	Water Rock-bristle	Water Vole	Saltmarsh & Mudflat	Sand Dunes	Transport Corridors
White-Clawed Crayfish			Trees & Hedgerows	Upland Hay Meadows	Whin Grassland

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 likely zone of influence of the proposal has been considered, including both potential direct effects such as habitat loss and potential indirect effects such as disturbance. Consideration has been given to potential effects both during the construction and operational phases of the development.

For this site the survey area comprised the purple line site wider ownership boundary. The direct footprint of the development is approximately 0.22 ha and is shown as a green line boundary. The survey area included all potential roost sites within and adjacent to the survey area, which may be affected by the proposals.

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 following types of ecological receptors have been considered:

- Statutorily designated sites for nature conservation.
- Non-statutorily designated sites for nature conservation.
- Species protected by law.
- Species and/or habitats listed under the NERC Act (2009) as being of principal importance for conservation of biodiversity.
- Species and/or habitats listed in relevant local biodiversity action plans.

The level of survey effort employed at the site has taken account of the recommendations within the Bat Conservation Trust Good Practice Survey Guidelines¹¹.

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

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

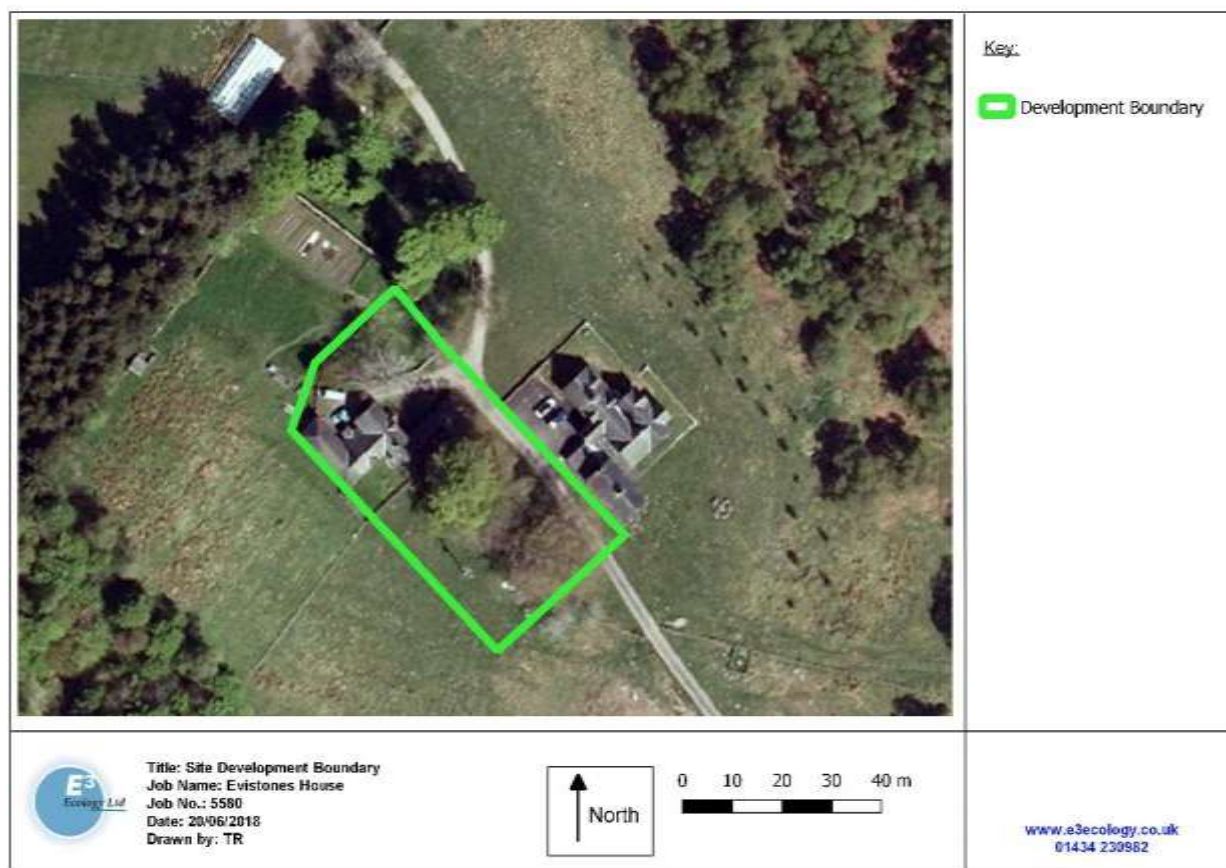


FIGURE 3: SITE BOUNDARY
(Reproduced under licence from Google Earth Pro.)

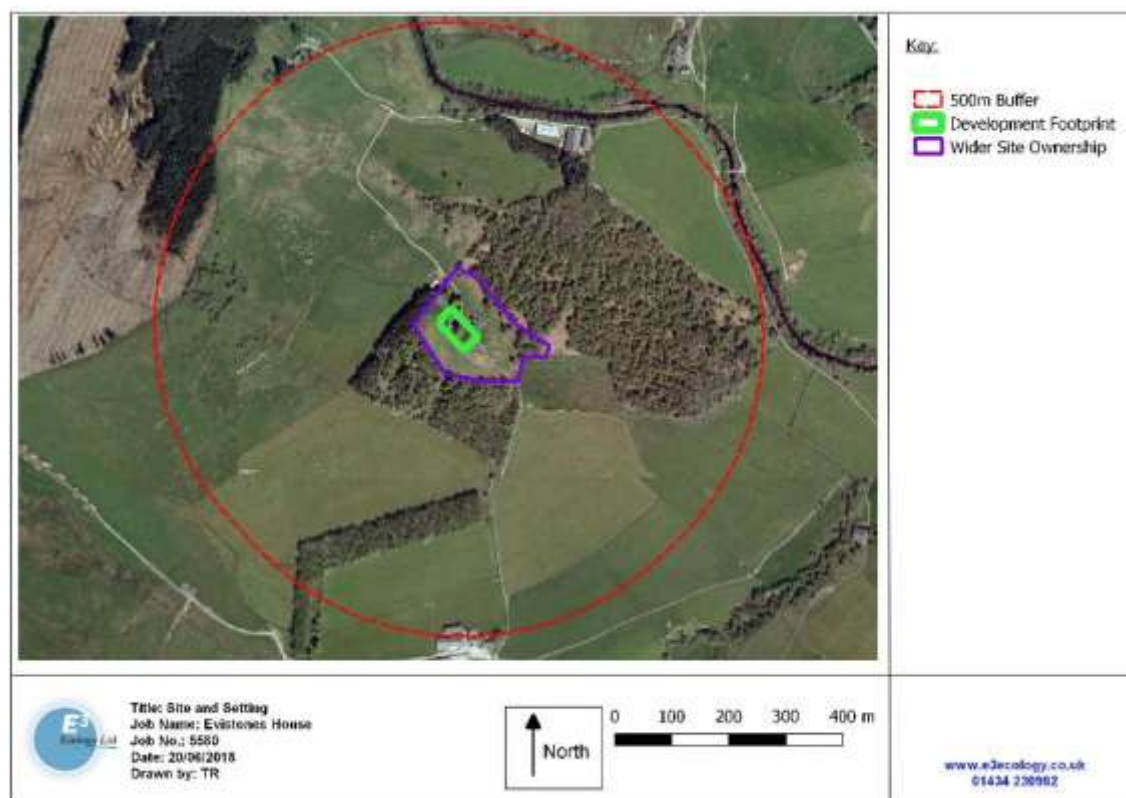


FIGURE 4: SITE AND SETTING
(Reproduced under licence from Google Earth Pro.)

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 Environmental Records Information Centre North East (ERIC NE) in June 2018, requesting data relating to protected or otherwise notable species and non-statutory sites for nature conservation within 2km of the survey area. In addition, a search was made of the MAGIC website¹² for all statutorily protected sites for nature conservation and European Protected Species Mitigation (EPSM) licences within 2km of the survey area.

D.3 PRELIMINARY FIELD STUDY METHODOLOGY

D.3.1 PHASE 1 HABITAT SURVEY

The field survey of the proposed site was conducted using the methodology of the Joint Nature Conservation Committee's Phase 1 Habitat Survey, as outlined in their habitat-mapping manual¹³. Each parcel of land was assessed by a trained surveyor and classified as one of ninety habitat types. These were then mapped and the habitat information supplemented by dominant and indicator species codes and target notes where appropriate. Where areas within the study area do not fall into the Phase 1 Habitat Survey classification, alternative methods of classification have been used.

D.3.2 PRELIMINARY PROTECTED AND PRIORITY SPECIES APPRAISAL

Where there is a risk of legally protected species and/or otherwise notable species¹⁴ being present, an initial appraisal was completed to inform the proposals. This appraisal included the following key elements:

- Structures and trees were assessed for the risk of supporting roosting bats and the potential suitability of the habitat for in relation to commuting and foraging activity by these species was also considered (see below).
- Wetlands, where present, were reviewed for their potential use by great crested newt, otter and water voles.
- If present, any trackways regularly used by badger were noted and any badger sett usage assessed by the presence of freshly dug earth or bedding at the entrance.
- The suitability of the suite of habitats present for use by reptiles was assessed.
- Likely use of the site by birds was assessed from the species seen during the survey, and the habitats present.
- Potential use by otherwise notable species was determined based on the broad habitat types present on site, any recent records obtained through the desk study and the geographical distribution of the species. Where specific habitat requirements for notable species have been recorded on site these have been noted and used as part of this appraisal. The species groups assessed are limited to birds, freshwater fish, amphibians, reptiles, terrestrial mammals, butterflies and dragonflies.

Where it is considered likely that there is a significant risk of protected or otherwise notable species being affected or where habitats are of particularly high value additional specialist survey work has been recommended. Further survey work may also be recommended where development proposals have the potential to affect statutorily designated sites in the vicinity.

¹² MAGIC [online] Available at: www.magic.gov.uk [accessed 29 June 2018]

¹³ JNCC (2010) *Handbook for Phase 1 habitat survey - a technique for environmental audit*. ISBN 0 86139 636 7.

¹⁴ To include national priority species as listed in Section 41 of the NERC Act (2006) and local or regional priority species as listed within the relevant Biodiversity Action Plan

D.3.3 HABITAT SUITABILITY ASSESSMENT (BATS)

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 Trust¹⁵ and detailed within the table below.

TABLE 5: 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.3.4 DAYTIME BAT RISK ASSESSMENT (STRUCTURES)

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

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

Wherever loft voids were present (Evistones Cottage and the Garage & Kennels) they were surveyed for signs of droppings, which persist all year in dry conditions, food debris, entry points and bats themselves. Where bats were present the survey was adapted to avoid disturbance, with identification being confirmed by recording bats at emergence and analysing the calls, and through DNA analysis of droppings. DNA analysis was carried out by Swift Ecology in November 2018.

Externally, the buildings were 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.

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

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 Trust¹⁶ and detailed within the table below.

TABLE 6: 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	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging 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.	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	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).	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	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.	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.

The bat risk assessment of the structures was undertaken on 25th June 2018.

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.3.5 DAYTIME GROUND BASED BAT RISK ASSESSMENT (TREES)

A preliminary assessment was made, based on inspection from within the site boundaries, of any trees affected by the proposed development. Trees were inspected and assessed for their

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

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 Guidelines¹⁷ and detailed within the table below.

TABLE 7: 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.

The ground-based tree survey was undertaken on 25th June 2018.

D.3.6 PRELIMINARY SURVEY/RISK ASSESSMENT - EQUIPMENT

- Clulite CB2 high powered torch;
- Vortex 10x42 binoculars; and
- Digital camera.

D.3.7 PRELIMINARY SURVEY/RISK ASSESSMENT - ENVIRONMENTAL CONDITIONS

TABLE 8: DAYTIME SURVEY CONDITIONS

DATE	SURVEY	TEMPERATURE	CLOUD COVER	PRECIPITATION	WIND CONDITIONS
25/06/2018	EA & Bat RA	22°C	10%	Dry	F2
27/06/2018	Waterbody assessment	26°C	100%	Dry	F2

D.3.8 PRELIMINARY SURVEY/RISK ASSESSMENT - CONSTRAINTS

Within Evistones Cottage, subsection 1B, the upper floor and room could not be entered fully on the northern elevation due to blockages by stored items. Within Evistones Cottage subsection 1C, the loft void was accessed from the western back chamber; insulation hid wooden trusses and therefore for health and safety the void was viewed from the vantage point of the loft hatch. This was not considered a constraint as the droppings appeared to be concentrated around the loft hatch.

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)¹⁸ and summarised within the table below.

TABLE 9: 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’.

In this case, the preliminary daytime inspection confirmed the presence of a roost within Evistones Cottage, the Kennels and Garage. The Shed was assessed as having moderate suitability for bats and was subsequently identified as a roost on the first dusk survey.

As such, two dusk emergence surveys¹⁹ were undertaken for roost characterisation on all three buildings within the development footprint.

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 10: ACTIVITY SURVEY	
DATE	DUSK OR DAWN
04/07/2018	Dusk
31/07/2018	Dusk

¹⁸ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

¹⁹ Roost characterisation surveys may be either dusk or dawn surveys.

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 BCT²⁰. 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 detected²¹, 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 field²². 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 an Anabat Express detector placed below Roost Entrance 1 on the Kennels and Garage on the survey on 31st July 2018, to assist in recording any quiet bat calls following a number of non-echolocating bats being recorded on the initial survey on 4th July 2018. Remote recording of bat activity was also undertaken within the loft void of Evistones Cottage in subsection 1D during the survey on 31st July 2018; this void has fairly open access with no loft hatch and a fixed loft ladder, and it was considered that placing the detector within the void would have minimal impact on any bats present

²⁰ http://www.bats.org.uk/pages/recording_light_level_data.html

²¹ Listening to frequency division calls as well as heterodyne significantly increases the detection rate of *Nyctalus* species

²² 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 22 person-nights work was undertaken and direct observation was reinforced by. 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.

The dusk survey completed on 31st July 2018 was undertaken in suboptimal conditions with intermittent rain. However, it is recognised within the BCT survey guidelines²³ that surveys may need to be undertaken in suboptimal conditions. This was not considered a constraint however as bats were observed re-entering roosts when rain intensified.

D.4.1.4 SURVEY EQUIPMENT

- Duet bat detector; and
- Anabat Express.

D.4.2 SURVEY CONSTRAINTS

Due to intermittent rain on 31st July 2018, the lux light meter was not used consistently in order to prevent damage to equipment. The Anabat Expresses were also occasionally sheltered from rain, and in some instances may not have recorded bats. However, this is not considered to be a significant constraint as surveyors were still in place with Bat Box Duets Surveys were undertaken in July; although this is within the maternity period (May to August) and there is a risk that peak maternity counts may be unrepresented.

As only a very small number of *Myotis* bats were recorded emerging, the majority of bat droppings found were assumed to be associated with the common and soprano pipistrelle maternity roosts. Therefore, samples were combined from various locations (shown in Figure 7) to maximise detection of *Myotis* species. This is not considered to be a significant constraint, as the buildings, which are in very close proximity, are considered highly likely to support a population of bats which moves freely between them.

D.4.3 DATA ANALYSIS

All bat calls were analysed using Analook with calls identified to species where possible, referencing call parameters as detailed within Russ (2012)²⁴ and Middleton et al (2014)²⁵.

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 11: PIPISTRELLE SPECIES IDENTIFICATION PARAMETERS
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²³ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust

²⁴ Russ, J. (2012) British Bat Calls: A Guide to Species Identification. Pelagic Publishing

²⁵ Middleton, N., Froud, A. and French, K. (2014) Social Calls of the Bats of Britain and Ireland. Pelagic Publishing

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.

D.5 PERSONNEL

The table below details the personnel who undertook the survey work and/or lead activity surveys. Details of other surveyors who assisted with activity surveys are provided in the appendices.

TABLE 12: PERSONNEL			
Name	Position	Professional Qualifications	Natural England Survey Licence Numbers
Taryn Rodgers	Ecologist	MA MSc ACIEEM	2017-27493-CLS-CLS
Mandy Rackham	Senior Ecologist	BA MSc MCIEEM	2015-12470-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 Management²⁶, 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 13: ECOLOGICAL RECEPTOR VALUATION	
Level of Value	Examples

²⁶ Chartered Institute for Ecology and Environmental Management (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater and Coastal

TABLE 13: 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
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

Aerial imagery between 2003 and 2009 shows no significant change in land use on or surrounding the site. Woodland is present to the north and south of the site, connecting to the River Rede riparian wooded corridor to the north. Within approximately 500m the predominant land use is pasture with occasional marshy/scrubby areas with field boundaries including dry stone walls and fencing. The River Rede lies approximately 425m east, with Cleughbrae Burn lying approximately 610m south.

MAGIC WEBSITE²⁷

A European Protected Species Mitigation licence was returned within 2km for a non-breeding site including common pipistrelle, whiskered/Brandt's and brown long-eared, dated 2011.

The wider site ownership boundary includes ancient semi-natural woodland on its northern elevation (approximately 0.36ha), and this extends >200m north, and to the south is broadleaved woodland. No other priority habitats lie within 200m.

The site is within Northumberland National Park, and within a SSSI Impact Risk Zone²⁸. However, this is limited to: airports, helipads, aviation proposals; air pollution (e.g. industrial processes, livestock and poultry units, slurry lagoons and manure stores); and combustion processes >50MW energy input. No statutorily designated sites are present within 2km of the survey area.

LOCAL KNOWLEDGE

Individual bats are found within the living environs of Evistones House regularly, indicating a probable roost within Evistones House²⁹.

E.1.2 CONSULTATION

ENVIRONMENTAL RECORDS INFORMATION CENTRE (ERIC NE)

The table below summarises the records provided by ERIC NE; all records are post-2000, unless stated otherwise. The full data search results can be provided on request.

TABLE 14: CONSULTATION RECORDS			
Taxon	Common name	No. of records	Records of note
Amphibian	Great crested newt	1	Dated 1988, ~550m distant
	Common toad	3	Dated 1988-1989, ~550m distant
Birds	Barn Owl	1	Dated 1988, ~550m distant
	Curlew	6	within ~1076m
	Kestrel	1	within ~2185m
	Meadow Pipit	19	within ~1296m

²⁷ MAGIC Website: www.magic.gov.uk

²⁸ The Impact Risk Zones (IRZs) are developed by Natural England to make a rapid initial assessment of the potential risks posed by development proposals to: Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites. They define zones around each site which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

²⁹ Mr James Pritchard, personal communication 25 June 2018.

	Oystercatcher	2	within ~1436m
	Peregrine	1	within ~1596m
	Rook	1	within ~2091m
	Skylark	20	within ~1348m
	Swallow	1	within ~1551m
	Willow Warbler	2	within ~1934m
Mammals (excluding bats)	Eurasian Badger	6	within ~927m
	Eurasian Red Squirrel	16	within ~66m
	European Otter	3	within ~1719m
	West European Hedgehog	1	within ~1679m
Bat	Brown Long-eared Bat	1	-
	Common Pipistrelle	5	within ~1952m
	Daubenton's Bat	1	within ~m
	Natterer's Bat	3	within ~1471m
	Soprano Pipistrelle	3	within ~1952m
	Whiskered/Brandt's Bat	1	-
Invertebrates	Garden Tiger	1	within ~1552m
Reptiles	Slow-worm	2	1999
	Adder	4	1999
	Common Lizard	3	1989

In addition, the records centre provided information relating to the following non-statutory designated sites which lie within the search area:

TABLE 15: NON-STATUTORY SITES			
Designation	Site Name	Reason for Designation ³⁰	Distance from Survey Area
Northumberland Local Wildlife Site	Tow Law Wood	-	~310m north

³⁰ A dash indicates no citation information has been provided by the Local Records Centre.

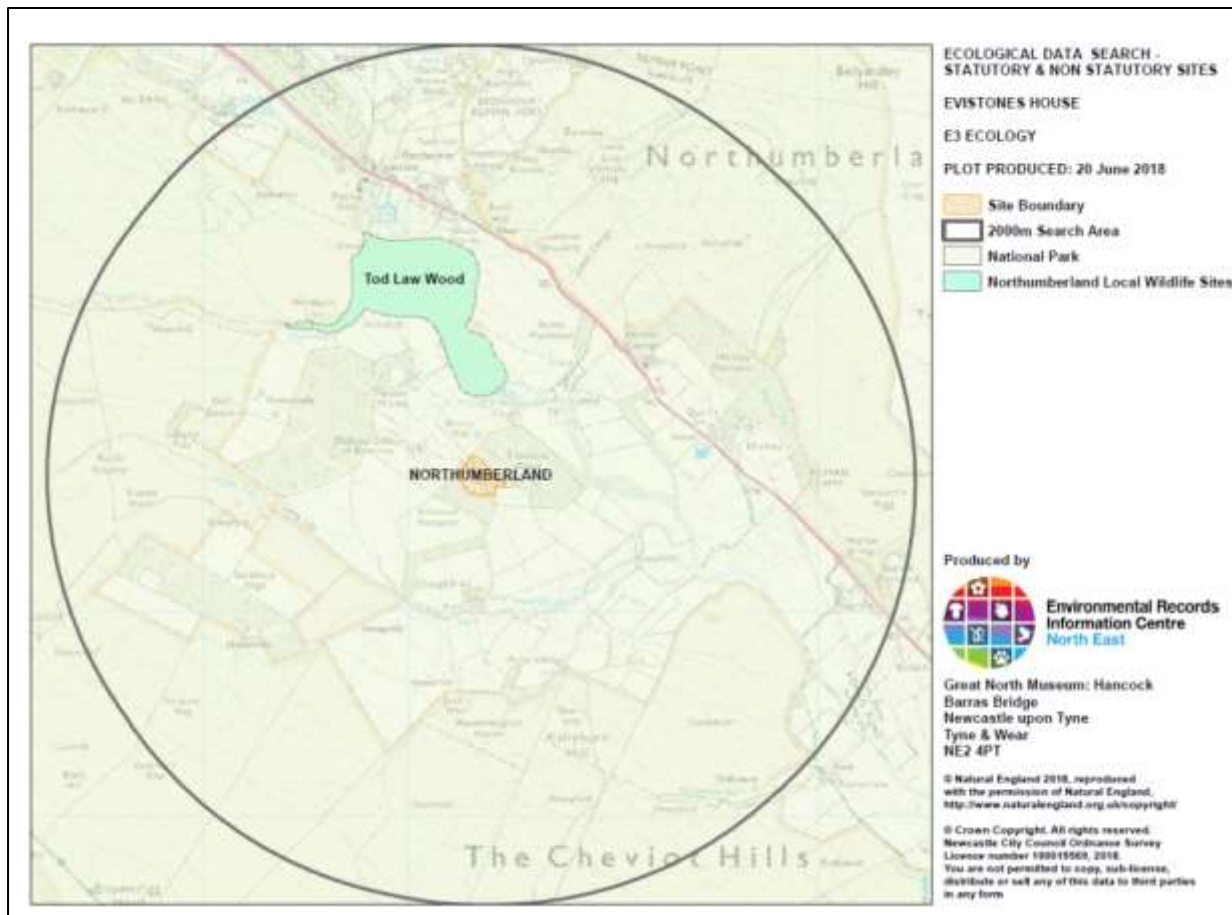


FIGURE 5: NON-STATUTORY WILDLIFE SITES (REPRODUCED FROM ENVIRONMENTAL RECORDS NORTH EAST)

E.2 FIELD SURVEY

E.2.1 HABITATS

The habitat within the direct development footprint includes buildings, hardstanding, poor semi-improved grassland, amenity grassland, and a very small area (<0.16ha) of semi-natural plantation woodland and semi-improved neutral grassland with bracken.

The habitats present within the development footprint and wider survey area are illustrated within the figure below and described in more detail below.

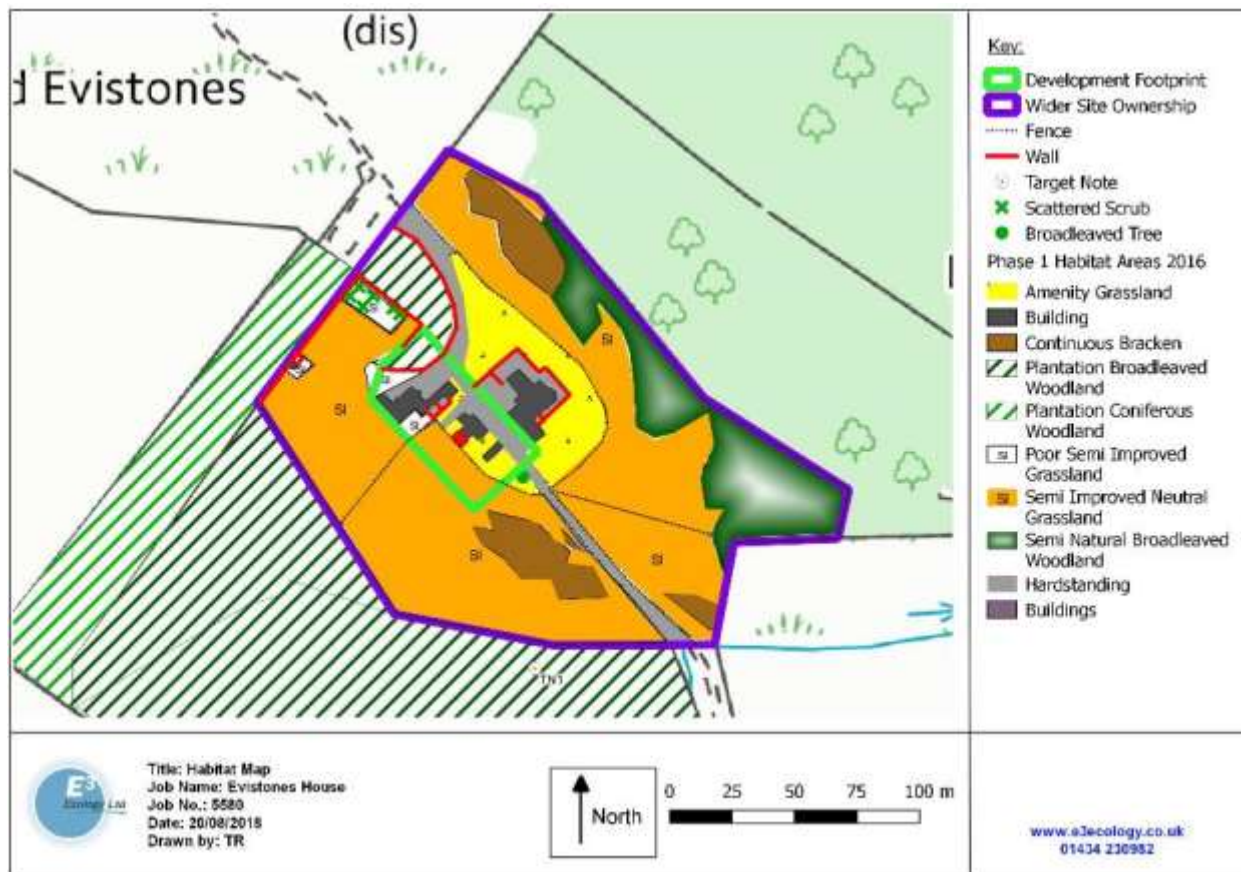


FIGURE 6: HABITAT MAP
(OS mapping © Crown copyright and database rights 2016/2017 OS 0100039392)

SEMI-IMPROVED NEUTRAL GRASSLAND AND BRACKEN MOSAIC

Semi-improved neutral grassland, characterised by lightly grazed rush pasture, comprising *Juncus effusus* and *Deschampsia cespitosa*. Small numbers of sheep were present.

Localised areas of improvement are present to the west, with dense stands of creeping thistle *Cirsium arvense* and common nettle *Urtica dioica*. Bracken *Pteridium* is also encroaching, with a dense stand present to the east. Species present include: soft rush *Juncus effusus* (abundant), tufted hairgrass *Deschampsia cespitosa* (abundant), Yorkshire fog *Holcus lanatus*, meadow foxtail *Alopecurus pratensis*, rough-stalked meadow grass *Poa trivialis*, sweet vernal *Anthoxanthum odoratum*, red fescue *Festuca rubra*, cocksfoot *Dactylis glomerata*, canary reed grass *Phalaris arundinacea*, false-oat grass *Arrhenatherum elatius*, common nettle, broadleaf dock *Rumex obtusifolius*, germander speedwell *Veronica chamaedrys*, wild Angelica *Angelica sylvestris*, pignut *Conopodium majus*, bird's-foot trefoil *Lotus corniculatus*, meadowsweet *Filipendula ulmaria*, common sorrel *Rumex acetosa*, scattered bracken,



Semi-improved neutral grassland to the south

creeping thistle, cleavers *Galium aparine*, Colt's foot *Tussilago farfara*, broadleaf dock, creeping buttercup *Ranunculus repens*, butterbur *Petasites* and red dead nettle *Lamium purpureum*.



Bracken

SEMI-IMPROVED NEUTRAL GRASSLAND, BRACKEN AND SEMI-NATURAL BROADLEAVED WOODLAND MOSAIC

Ancient semi-natural broadleaved woodland dominated by downy birch *Betula pubescens* is present (extended beyond the site boundary to the north) with a semi-improved neutral grassland understorey, which extends to the south. The grassland is variable, with the dominant species within the sward changing from red fescue to creeping soft-grass *Holcus mollis*, with sweet vernal *Anthoxanthum odoratum*, wood sorrel *Oxalis acetosella*, creeping buttercup and occasional encroaching bracken *Pteridium aquilinum* also present. Trees are up to 20m high with diameter at breast height (DBH) up to ~40cm. A dense stand of bracken is present to the northwest.



POOR SEMI-IMPROVED GRASSLAND AND SCATTERED SCRUB

The walled garden consists of rank poor semi-improved grassland with abundant Yorkshire fog, cocksfoot and, with encroaching scrub, including elder *Sambucus nigra*, dogwood *Cornus sanguinea*, honeysuckle *Lonicera*, Buddleja *Buddleja*, and willow sp. *Salix* sp. Garden escapees such as Wargrave pink' *Geranium x oxonianum* is present, and encroaching tall ruderal including bramble *Rubus fruticosus* agg., common nettle, broadleaved willowherb *Epilobium montanum* and creeping thistle. A 2m high stone wall, generally in good condition but with some mortar gaps, including at stone ridge is present and is considered to have low bat roost suitability. This has not been surveyed as it lies outside the development footprint.



Walled garden



Wall

POOR SEMI-IMPROVED GRASSLAND

Rank grassland with Yorkshire fog (abundant), perennial ryegrass *Lolium perenne*, broadleaf dock, rough stalked meadow grass *Poa trivialis*, *Montbretia*, soft brome *Bromus hordeaceus*, cleavers and common nettle. This grassland encroaches on former hardstanding/garden areas associated with the northern and southern elevations of Evistones Cottage.



AMENITY GRASSLAND

Amenity grassland is present around the buildings, although the majority is to the north around Evistones House. Managed by regular cutting, the sward length is ~5cm with species including perennial ryegrass and red fescue. Species present included Timothy-grass *Phleum pratense*, meadow foxtail *Alopecurus pratensis*, perennial rye grass and white clover *Trifolium repens*, red fescue, forget-me-not *Myosotis* sp., creeping buttercup, daisy *Bellis perennis*, *Holcus lanatus*, Yorkshire fog, annual meadow grass *Poa annua*, common dandelion *Taraxacum officinale* and broadleaved willowherb.



PLANTATION BROADLEAVED WOODLAND

Plantation broad-leaved woodland dominated by sycamore trees up to 20m high, with a DBH approximately 40cm. This area is surrounded on 3 sides by an approximately 1m high dry stone wall, with a >2m high stone wall shared with the walled garden. Birch sp *Betula*. and elder saplings present, with a common nettle understorey. The trees have negligible to low bat suitability.



CONIFEROUS PLANTATION WOODLAND

Outside but adjacent to the site boundary, coniferous plantation woodland is present with yew *Taxus baccata* and Norway spruce *Picea abies*, chickweed *Stellaria media* ground flora. The surrounding stone wall rises up to 2m.



E.2.2 TARGET NOTES

TARGET NOTE 1

Plantation broadleaved woodland with field maple *Acer campestre*, sycamore *Acer pseudoplatanus*, birch sp. and ash *Fraxinus excelsior*, with a bracken and bramble understorey and ~10-20cm, with creeping soft-grass, tufted hair grass, soft rush and opposite-leaved golden saxifrage *Chrysosplenium oppositifolium*. Scattered rocks are also present. The majority of trees from the fence line appeared to have negligible bat roost suitability, but one tree with standing deadwood with moderate bat roost suitability was observed.



E.2.3 SPECIES (EXCLUDING BATS)

GREAT CRESTED NEWT

Three potentially suitable waterbodies were identified within 500m of the site boundary, including waterbody 1 70m southwest, waterbody 2 100m southwest and waterbody 3 195m southwest.

The amenity grassland around the buildings to be demolished is considered to have low suitability for great crested newt; however, there is a small amount of neutral semi-improved grassland and broadleaved plantation woodland within the development boundary, considered to have higher suitability for the species. An assessment of the waterbodies identified was therefore carried out, and all waterbodies were dry with 100% vegetation cover. Great crested newt are therefore considered likely absent from the site.

BIRDS

The buildings have potential to support house martin, and with active nests were observed on the Kennels and Garage. Old swallow nests are present within subsection 1B of Evistones Cottage. Species noted on site include house martin, pied wagtail, goldfinch and carrion crow.

No signs of barn owl such as pellets were found on site. ERIC NE returned a single historical record (dated 1988) for barn owl within 2km of the site. The shed and potentially the dovecot associated with Evistones cottage, and open sided barns, have some suitable habitat for barn owl and may therefore have the potential to be used in the future. The Kennels and Garage is not considered suitable for barn owl as there are no potential entrances for this species.

BADGER

The development site is suboptimal for badger and no field signs were present within 30m.

REPTILES

The habitat within the wider site ownership has high potential for reptiles. There is low potential that reptiles may occasionally bask or commute over the direct development footprint.

RED SQUIRREL

Consultation data returned red squirrel records within the local area, and the woodland within the site ownership boundary is suitable for red squirrel. However, it is considered unlikely that red squirrel will use the smaller trees adjacent to the building.

OTTER, WATER VOLE AND WHITE-CLAWED CRAYFISH

There are no watercourses within the site boundary, and waterbodies to the south of the site were dry during time of survey. Therefore, these species are considered likely absent from the site and are not discussed further.

BUTTERFLIES

It is considered unlikely that a breeding population of priority butterflies would be present within the small areas of grassland within the direct development footprint. Therefore, they are not considered further.

NATIONAL PRIORITY AND LOCAL BAP SPECIES

The habitat within the wider site ownership boundary is suitable for hedgehogs and brown hare. Brown hare are considered unlikely to be present within the direct development footprint, but hedgehog may occasionally forage or commute across it.

INVASIVE PLANT SPECIES

Montbretia (a Schedule 9 invasive species under the Wildlife & Countryside Act 1981 (as amended)) is present adjacent to Evistones Cottage.

E.3 DAYTIME RISK ASSESSMENT (BATS)

E.3.1 HABITATS

FORAGING HABITATS AND COMMUTING ROUTES

Ancient semi-natural woodland is present to the north of the proposed development. The woodland and pasture around the site provide high quality foraging habitat and connects to the wider landscape creating a high-quality commuting route.



SHELTERED FLIGHT AREAS

Evistones Cottage – subdivision 1E (sheltered open barn) and Evistones Cottage – subdivision 1D (barn) provide opportunities for foraging in suboptimal weather conditions.



ALTERNATIVE ROOST LOCATIONS

Evistones House, opposite the buildings surveyed, has suitability for bat roosts, as do trees within the ancient semi-natural woodland.

E.3.2 BUILDINGS

The following text 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.

EVISTONES COTTAGE – CONFIRMED ROOST

Pre-20th century stone built former coach house. Pitched slate roof and dressed stone construction, with wooden fascias. Generally has slipped slates, gaps between tiles, gaps at wall tops, gaps under bargeboards, and gaps at chimney stacks. The cottage has several subdivisions, and features and field sign of note are discussed below.

Evistones Cottage – subdivision 1A (shed)

Single-storey dressed stone, pitched slate roof with stone ridge and stone bargeboard. Roof felt lined with wooden trusses, open roof void and half-boarded access. Slipped slates. Mortar gaps in stone. Gaps in wooden doors. Mortar gaps in stone. Gaps at wall tops, and where guttering present. The site has hibernation potential.

Three bat droppings present in a sink with 1 dropping on adjacent wall on western elevation internally. Three droppings on southern elevation on a shovel and on wooden bench internally.

Evistones Cottage – subdivision 1B (stable/kennel)

As per 1A, but without obvious felt lining - wooden sarking instead. Upper vent has no obvious mesh preventing access. Active house martin nest present. The stable/kennel walls extending out into hardstanding are ~1m high and well mortared. A large gap in wooden door allows free access internally.

One, potentially two potential bat droppings (degraded) found below gap at wall top. Within interior on northern elevation one bat dropping and a tortoiseshell butterfly wing was found.

Evistones Cottage – subdivision 1C (cottage)

Two-storey, construction as per 1A, except with loft void present, flashing, dovecot and chimney stacks. Slipped tiles and mortar gaps at ridge and in walls, gaps under bargeboard apex and wooden fascia.

1B1: bat droppings externally including on window, bin and small wooden porch extension. House martin



droppings also present externally.

1B2: droppings on window sill and wall externally.

Evistones Cottage – subdivision 1D (barn)

The roof is unlined with wooden cladding on the eastern elevation and random stone wall. There are gaps >1m high in the ground floor stone walls.

Single bat dropping on lower ground wall, below a gap in the wall top. Small piles of bat droppings with occasional feeding remains (small tortoiseshell, peacock butterfly and moth wings) on mezzanine floor within open roof void, mostly under the central ridge.

Droppings were present on the rendered concrete wall, above which are gaps in the wood cladding, allowing entry between the sarking and slates on eastern elevation (also possible entry into wall itself). Following reinspection of the loft void on 31 July 2018, over 500 droppings were found concentrated below a gap in the wood sarking.



Evistones Cottage – subdivision 1E (sheltered open barn)

Potential roost features between kingpost roof trusses. The roof is lined, and there are possible gaps at wall tops.



GARAGE AND KENNELS – CONFIRMED ROOST

Single-storey dressed stone building, constructed within the last 8-10 years. Wood bargeboards, soffits and fascias and doors. Pitched slate lined roof with slipped slates, wooden trusses and a large open roof void which is boarded out. Stone ridge present. Active house martin nest present.



Droppings were concentrated within the roof void at the apex of the southeast gable with over five hundred droppings present, and social calls could be heard during the survey.

Bats appeared to present above the location of these droppings, either in the gap within the breezeblock or behind lining. Droppings were scattered throughout the void, with a small number under the internal northwest gable apex. Droppings were present under the southeast gable bargeboards externally, and in two locations on the western elevation suggesting entry at



Southeast gable internally

wall tops. Droppings were also scattered on the kennel boundary wall tops, likely deposited by bats flying over.



Southeast gable internal access point above loft hatch & droppings



Southeast gable externally with droppings

SHED – MODERATE SUITABILITY

Single-storey dressed stone with open roof void with stone cladding. Pitched slate roof with overhanging wooden bargeboards and open roof void. Slipped slates and interior gaps above windows. **A small number of bat droppings were found on an overhanging roof on a small store; the accumulation suggests they were deposited by roosting bats.**



SMALL SHED - LOW

Single-storey random stone construction with unlined slate roof and stone ridge. Gaps at wall tops, mortar gaps, missing tiles and gaps at ridge. Internally gaps at wall tops and at roof trusses; no door so open access. Old house swallow nest present internally. Surrounding stone wall is ~1m high with small gaps. Low hibernacula potential.



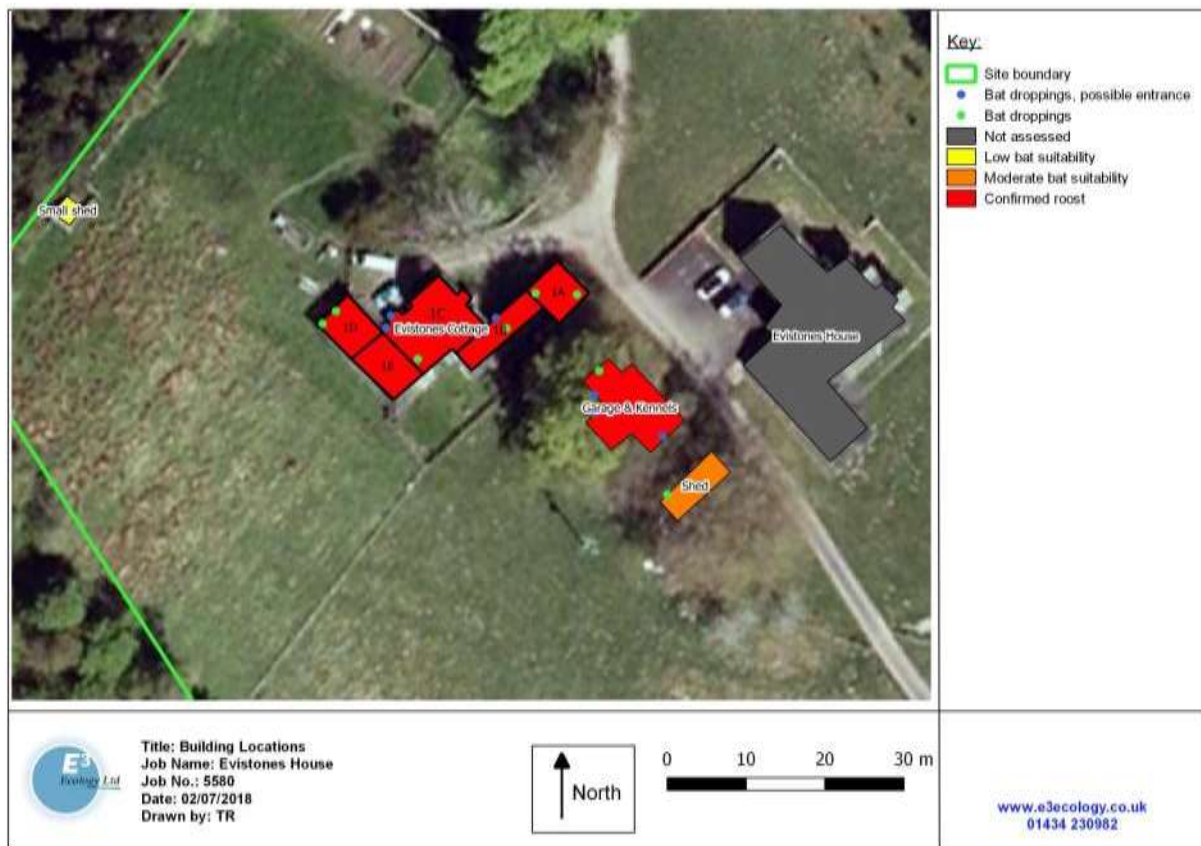


FIGURE 7: BUILDING LOCATIONS & BAT DROPPING LOCATIONS
(Reproduced under licence from Google Earth Pro.)

E.3.3 TREES

There are several trees within the direct development footprint with negligible to low suitability for bats in the north western corner of the development. They are predominately elder and birch saplings, with occasional mature sycamore. No obvious potential bat roost features were observed from the ground-based assessment

E.4 OVERVIEW OF SITE SUITABILITY

The table below provides an overview of site suitability in relation to bats.

TABLE 16: OVERVIEW OF SITE SUITABILITY FOR BATS				
HABITATS AND SETTING ³¹				
	NEGLECTIBLE	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

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

TABLE 16: OVERVIEW OF SITE SUITABILITY FOR BATS

				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 site habitat and buildings are considered to be of high suitability.

E.5 DUSK EMERGENCE ACTIVITY SURVEYS

04th July 2018

The survey was undertaken in mild (17°C) dry weather with a low wind speed (F1). The first bat observed was a soprano pipistrelle emerging at 21:50 from Evistones Cottage. A moderate level of bat activity continued throughout the survey. The following roosts were identified:

- Kennels and Garage: 36 bats emerging from six locations, including 5 non-echolocating bats, 24 soprano pipistrelles, 6 common pipistrelle bats and 1 *Myotis* spp.
- Shed: 1 roost with a single non-echolocating bat (likely to be a common, soprano pipistrelle or *Myotis* based on activity at 22:27 emergence time).
- Evistones Cottage: 14 bats emerging from 7 locations, including: 3 common pipistrelles, 8 soprano pipistrelles, 2 non-echolocating bats and 1 pipistrelle (echolocated at 50).

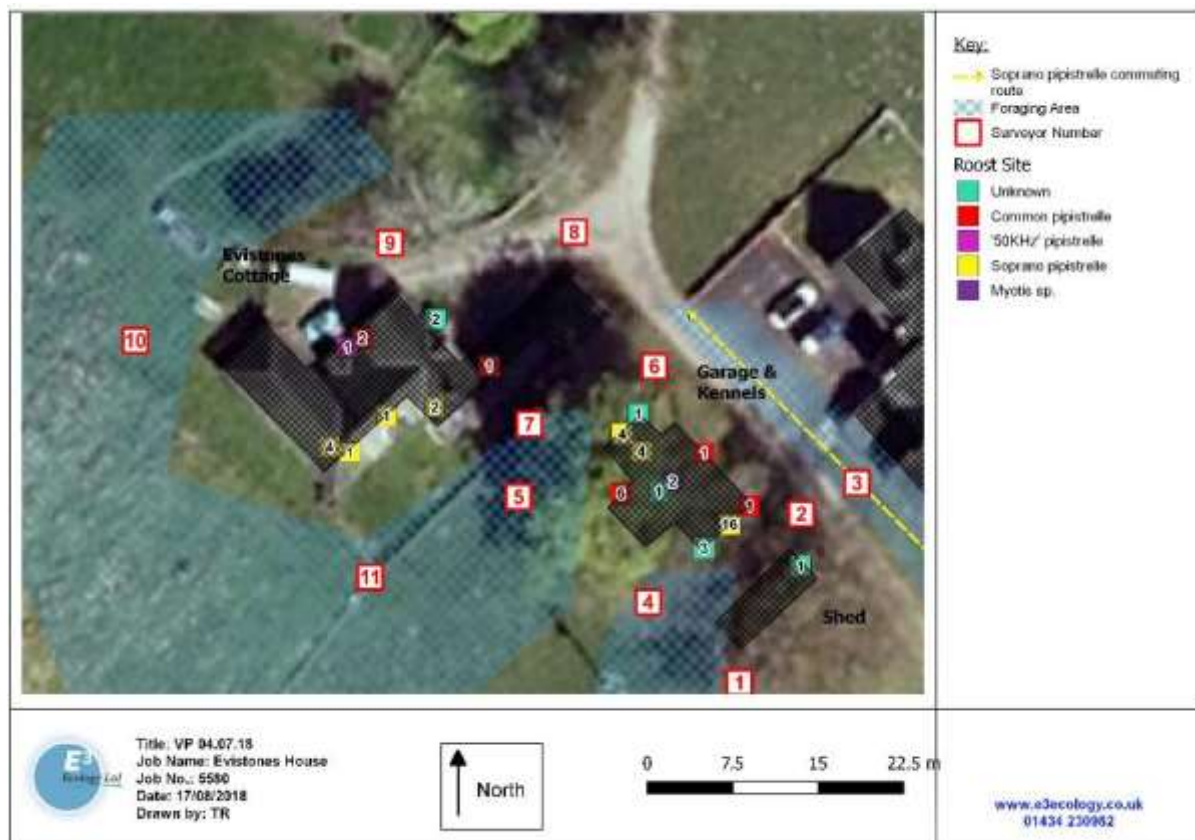


FIGURE 8: SUMMARY OF DUSK EMERGENCE SURVEY RESULTS 4TH JULY 2018

(Reproduced under licence from Google Earth Pro.)

30th July 2018

The survey was undertaken in mild (17°C) dry weather with a low wind speed (F1). The first bat observed was a common pipistrelle at 21:20; this was not seen emerging. A moderate level of bat activity continued throughout the survey. The following roost were identified:

- Kennels and Garage: 46 bats emerging from 5 locations, including 17 soprano pipistrelles, 17 common pipistrelles, 1 *Myotis* and 11 non-echolocating bats. The number of droppings present externally had increased since the preliminary assessment on 25th June 2018, where single droppings were found, forming a thick layer in places around gaps under the fascia, suggesting prolonged use.
- Shed: no emergences.
- Evistones Cottage: 18 bats emerged from 6 locations, including 10 common pipistrelles, 1 soprano pipistrelle, 6 non-echolocating bats, and 1 *Myotis*. Within the loft void of 1D the number of bat droppings found since the initial assessment on 25th June 2018 had increased, with around 500 droppings found below a gap in the wood sarking.

On site, common pipistrelle, soprano pipistrelle, noctule and *Myotis* sp. bats have been recorded foraging and commuting. It is considered likely that the non-echolocating bats recorded emerging and re-entering during surveys were soprano pipistrelles, as this is the predominant species present on site.

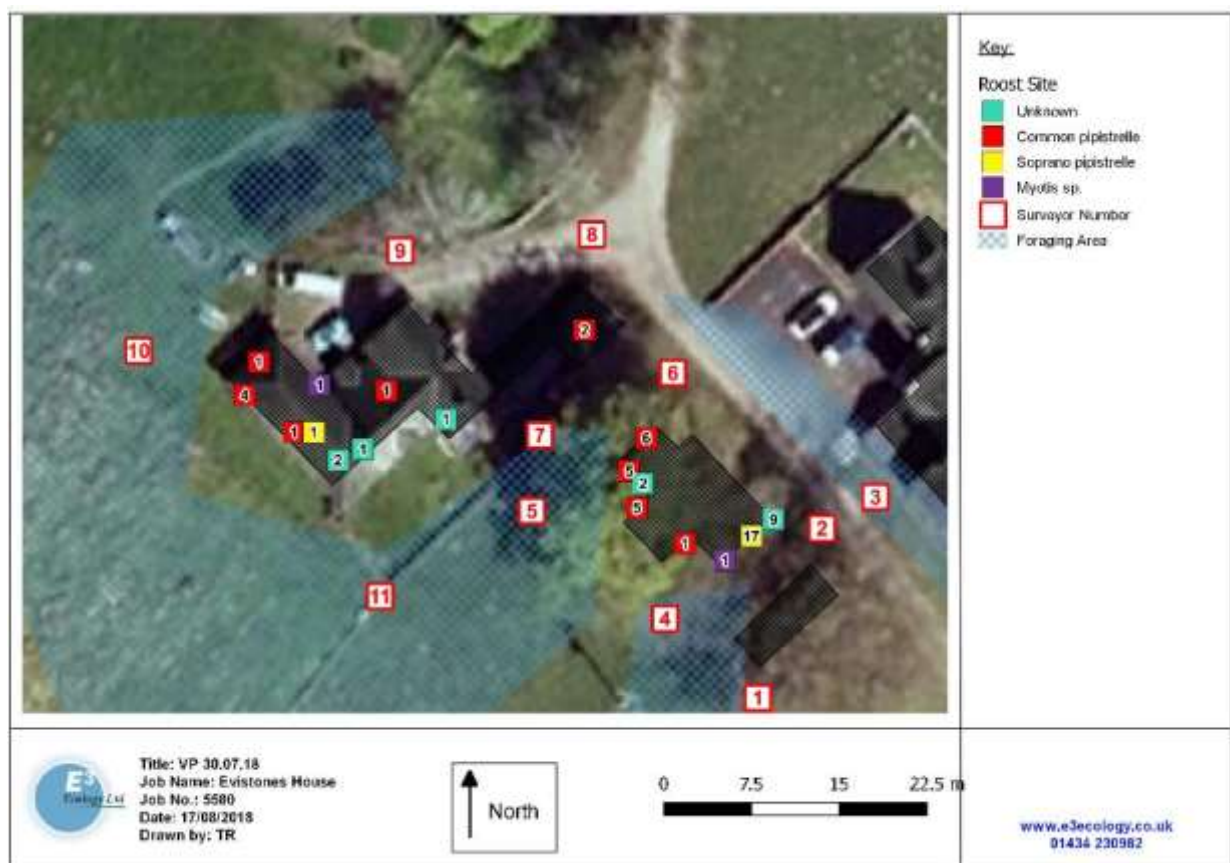


FIGURE 9: SUMMARY OF DUSK EMERGENCE SURVEY RESULTS 30 JULY 2018
(Reproduced under licence from Google Earth Pro.)

Key survey data are provided in Appendix 4. In summary, the following peak counts were:

- Kennels and Garage: The peak count for bats emerging during a survey is 46. The peak count per species is: 24 soprano pipistrelles, 17 common pipistrelles and 1 *Myotis* spp. The peak count for non-echolocating bats was 11, and these are likely to be pipistrelle bats based on surrounding activity.
- Shed: The peak count was a single non-echolocating bat.
- Evistones Cottage: The peak count for bats emerging during a survey was 18. The peak count per species is: 10 common pipistrelles, 8 soprano pipistrelles, 1 *Myotis*, 1 pipistrelle sp. (echolocating at 50) and 6 non-echolocating bats (likely to be pipistrelles based on surrounding activity).

E.6 ADDITIONAL SPECIES GROUPS RECORDED DURING ACTIVITY SURVEYS

House martins were nesting on the Kennels and Garage, and swallows were nesting within Evistones Cottage, on subsection 1B.

E.7 DNA ANALYSIS

DNA analysis of droppings confirmed the presence of the following species: common pipistrelle, soprano pipistrelle, Natterer's bat and Brandt's bat.

F. SITE ASSESSMENT

F.1 HABITATS

The habitat within the direct development footprint is predominantly buildings, hardstanding, poor semi-improved grassland and amenity grassland considered to be of low value. It also includes a very small amount of semi-natural broadleaved woodland to the northwest and semi-improved neutral grassland with bracken to the south, considered to be local value. These areas will be lost under current development proposals.

F.2 NOTABLE SPECIES (EXCLUDING BATS)

The buildings to be demolished have swallow and house martins nesting, and the potential for nesting passerine birds within crevices and jackdaws within loft voids. The grassland on the direct development footprint has low potential for foraging birds. The Shed and Evistones Cottage are considered suitable for barn owl. However, no signs of barn owl such as pellets were found on site, and no barn owls were observed during the bat activity surveys. This species is therefore considered likely to be absent from site. The buildings are considered to have local value to nesting birds.

The amenity grassland around the buildings to be demolished is considered to have low suitability for great crested newts, and the neutral semi-improved grassland within the site boundary and the broad-leaved plantation woodland adjacent to the boundary are considered to have higher suitability for the species. As all waterbodies within 500m were dry with 100% vegetation cover, it is considered that the waterbodies are dry most years and great crested newt are therefore likely absent from the site.

The development site is suboptimal for badger and no field signs were present within 30m; there is a very low risk that badgers may occasionally be present within the development area. There is low potential that reptiles may occasionally bask or commute over the direct development footprint. Hedgehogs may also be occasionally be present. If these species are present, the site is considered to be of low value to these species based on the small size of and nature of these habitats, with abundant habitat in the local area.

No other priority or notable species are considered likely to be impacted by the proposed development.

F.3 ASSESSMENT OF SURVEY FINDINGS (BATS)

Survey has confirmed that the site supports small soprano and common pipistrelle maternity roosts, which likely move between Evistones Cottage, the Kennels and Garage and possibly also Evistones House, depending on weather conditions and potential parasite loads. The site also supports a small number of day roosts for Natterer's and Brandt's bats (confirmed by DNA analysis). It supports a day roost for an unknown bat on the Shed, likely to be a Natterer's, Brandt's or pipistrelle sp. based on activity on site.

The buildings also have potential to be used as a hibernation roost, and to be used as a day roost by soprano and common pipistrelles, Natterer's and Brandt's bats. The site is considered to have at least parish value for bats.

There are several trees within the direct development footprint with negligible to low suitability for bats in the north western corner of the development. They are predominately elder and birch saplings, with occasional mature sycamore. No obvious potential bat roost features were observed from the ground-based assessment.

The proposed development is unlikely to sever any commuting routes or significantly reduce bat foraging habitat, although there is potential for disturbance through increased lighting.

F.4 POPULATION SIZE CLASS ASSESSMENT (BATS)

From the field survey, it is concluded that the Kennels and Garage and Evistones Cottage are used by a small common pipistrelle maternity roost (peak count 17 and 10 respectively) and soprano pipistrelle bats (peak counts 24 and 8 respectively). They are also used by *Myotis* bats as day roosts (peak count 1 respectively) at intervals through the year, with species including Natterer's and Brandt's bats. The Shed supports a day roost, likely to be Natterer's, Brandt's or pipistrelle sp. (peak count 1). The buildings also have potential to be used as a hibernation roost, and to be used as a day roosts by soprano pipistrelles and common pipistrelles (1-6 per roost) at intervals through the year. The survey peak count for bats emerging on site over all three buildings is 64.

F.5 LIMITATIONS

Survey completed at the site will provide reasonably typical data for the summer period, and internal field signs are likely to reflect activity over the preceding two or three months. 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. Due to intermittent rain on 31st July 2018, the lux light meter was not used consistently in order to prevent damage to equipment. The Anabat Expresses were also occasionally sheltered from rain, and in some instances may not have recorded bats. However, this is not considered to be a significant constraint as surveyors were still in place with Bat Box Duets.

G. IMPACT ASSESSMENT

The likely effects of the proposed development, without appropriate targeted mitigation and/or compensation, are detailed below.

G.1 POTENTIAL IMPACTS AND/OR EFFECTS³²

G.1.1 HABITATS

- Loss of a small area of amenity, poor semi-improved grassland, buildings and hardstanding of low value.
- Loss of a small amount of semi-natural broadleaved woodland to the northwest and semi-improved neutral grassland with bracken to the south, considered to be local value.
- Potential spread of the invasive plant species *Montbretia*.

G.1.2 SPECIES

- Loss of small maternity roosts used by common and soprano pipistrelles of at least parish value.
- Loss of Natterer's and Brandt's bat day roosts, and potentially soprano common pipistrelle and common pipistrelle day roosts of local value.
- Loss of buildings with potential as a bat hibernation roost.
- An increase in disturbance to bats due to increasing lighting levels.
- Loss of nesting opportunities, and potential destruction of nests, for swallows, house martins and potentially other passerine birds utilising the buildings.
- Loss of buildings with potential to support barn owl.
- Potential entrapment of mammals including badgers and hedgehogs through any excavation works.
- Potential harm to reptiles which may utilise small areas of semi-improved grassland and amenity grassland within the development footprint.

G.2 POTENTIAL IMPACTS AND/OR EFFECTS ON STATUTORY AND NON-STATUTORY SITES DESIGNATED FOR NATURE CONSERVATION

The site is within Northumberland National Park, and within a SSSI Impact Risk Zone. However, the risk zone does not relate to residential developments, and the proposed development is considered to have a negligible impact on habitats within the national park. No statutorily designated sites were present within 2km of the survey area. There is a single non-statutory site, Tow Law Wood, within 500m of the site. As the proposed development is replacing existing buildings, and a likely increase in use of 2-4 people, a negligible impact is expected on this single non-statutory site.

G.3 RECOMMENDATIONS

The mitigation strategy aims to minimise effects on biodiversity by:

- Avoiding significant negative impacts where possible through good design.
- Developing approaches to mitigate any remaining unavoidable impacts.

Where any significant residual impacts on biodiversity are anticipated, compensation may then be proposed. This approach is in-line with CIEEM recommendations³³.

³² An impact is defined as an action resulting in changes to an ecological feature. For example, construction works removing a hedgerow. An effect is defined as the outcome to an ecological feature from an impact. For example, the effect on a dormouse population of the loss of a hedgerow.

³³ Chartered Institute for Ecology and Environmental Management (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater and Coastal

G.4 FURTHER SURVEY

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

G.5 AVOIDANCE AND MITIGATION STRATEGY

G.5.1 SITE DESIGN

- External lighting that may reduce bat use of potential roost sites (retained and/or new) will be avoided. High intensity security lights will be avoided as far as practical, and any lighting in areas identified as being important for bats will be low level (2m) and low lumen. Light spillage to areas used by foraging or commuting bats should be less than 2 lux. No lighting will be installed along the flyways between the potential roosting features and adjacent trees, woodland and foraging areas. Where security lights are required, these will be of minimum practicable brightness, be set on a short timer and will be motion sensitive only to larger objects.
- Access for swallows should be included within the new garage building, consisting of a small opening, H:50mm x W:200mm, under the eaves. A nest platform should be fixed internally, and a detachable board can be placed 2m beneath to catch any droppings.
- Eaves or flat-bottomed overhangs or a ledge about 120mm wide should be incorporated, preferably on north or east facing walls, with 3 artificial house martin nests. A detachable ledge can be placed 2m below to catch any droppings.

G.5.2 TIMING OF WORKS

- Demolition of the buildings will be undertaken outside of the bird nesting season (March to August inclusive) unless a checking survey by a suitably experienced ornithologist confirms the absence of active nests (which will include a check for barn owl).
- **Works on site will not commence until a Natural England 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/cherry picker access has been provided.
- The following key elements of work will not be commence during the hibernation period (mid-November to mid-March inclusive):
 - Demolition of stonework.
 - Removal of ridge tiles and slates.
 - Removal of roof timbers.
 - Exposing of the wall tops via roof stripping works.
- Works on site will not commence during the maternity period (June to August inclusive) unless a confirming survey has demonstrated that maternity roosts are absent. If substantial disturbance has occurred before the maternity season, such as removal of roofs, then maternity roosts are very unlikely to become established and spring work may continue into the summer.
- If required, exclusion will not be completed during the maternity period (June to August inclusive) unless the site inspection completed by the project ecologist has confirmed that maternity roosts are absent. No exclusion will be undertaken during the hibernation period (mid-November to mid-March inclusive).

G.5.3 WORKING METHODS AND BEST PRACTICE

- Any excavations left open overnight will have a means of escape for mammals that may become trapped in the form of a ramp at least 300mm in width and angled no greater than 45°.
- 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/cherry picker access is provided, the project ecologist will carry out a detailed inspection of the structures.
- Where evidence of current use is recorded, the project ecologist will install standard one-way exclusion valves. If one-way valves are used these will be left in place for a minimum of 3 nights when temperatures remain higher than 10°C for at least one hour after dusk. No exclusion will be undertaken during the maternity period (June to August inclusive) unless the site inspection completed by the project ecologist has confirmed that maternity roosts are absent. No exclusion will be undertaken during the hibernation period (mid-November to mid-March inclusive).
- Old slates, coping stones, ridge tiles, flashing, fascias and bargeboards will be removed carefully by hand, being aware that bats may be present beneath slates or ridge tiles, within mortise joints, cavity walls, between loose stones, between lintels and in gaps around window frames and in sash windows.
- 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 invasive species *Montbretia* should be removed under contractor method statement.
- All vegetation within the development footprint will be strimmed short during the active reptile season (April to September) and all arisings shall be removed from the site. Building materials should be stored on hardstanding or on raised pallets to minimise the risk of creating wildlife refugia.
- All works should be undertaken within a minimum easement and avoid disturbance of any habitats outside the direct development footprint.
- Works be undertaken under a precautionary method statement for reptiles.

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

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

G.6 **COMPENSATION STRATEGY**

The following compensation strategy is proposed:

G.6.1.1 *BARN OWL*

A barn owl box should be erected on a mature tree facing open habitat within the landowner's site holding. The tree should be in a hedgerow or located on a woodland edge, and have a high canopy with few or no lower branches. The box should be erected at least 3m high, with the access hole visible even when the tree is in full leaf.

G.6.1.2 *BAT BOXES*

In advance of the start of works 12 bat boxes 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 6 suitable for use by breeding bats, 5 crevice boxes, and 1 suitable for hibernation use by small numbers of bats. These bat boxes will be used as mitigation within the Natural England licence for the loss of breeding and day roost sites, and the potential loss of a hibernation site, until compensation is incorporated within the new buildings.

G.6.1.3 *CREVICE ROOST SITES*

A total of 5 external crevice roost sites within the walls of the new buildings will be 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.

Access to the underside of the ridge tiles will be provided in 5 locations through 20mm diameter gaps in the pointing. Access between ridge tiles will be provided through gaps in the mortar joints.

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

G.7 **MONITORING**

As a condition of the Natural England licence the site will be monitored for a period of 1 year following completion of the development works.

G.8 **ADDITIONAL ENHANCEMENT RECOMMENDATIONS**

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

- The landscape planting will be designed to enhance structural diversity, and will include plants bearing flowers, nectar and fruits which are attractive to invertebrates, thereby helping to maintain the food resource for bats and wildlife generally.

APPENDIX 1. STATUTORILY AND NON- STATUTORILY DESIGNATED SITES

STATUTORILY DESIGNATED SITES

Ramsar Sites

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 (SPAs)

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

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

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 Reserves (NNRs)

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.

NON-STATUTORILY DESIGNATED SITES

Local Nature Reserves (LNRs)

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-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 Sites (LWSs)

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 ³⁴																								
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																								

³⁴ 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 uncommon³⁵. 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 roosts³⁶.

Maternity colonies of brown long-eared bats are generally small, consisting of 10 to 20 adults^{37,38} (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 tunnels³⁹. 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 Scotland⁴⁰. 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 bats⁴¹. 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 used⁴².

³⁵ Roberts, G.M. & Hutson, A.M. 2000. *Pipistrelle*. British Bats No. 6. The Bat Conservation Trust, London

³⁶ Corbet, G.B & Southern, H.N., 1964. The handbook of British Mammals).

³⁷ 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

³⁸ 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

³⁹ 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.

⁴⁰ 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.

⁴¹ Altringham, J.D. 2003. British Bats. The New Naturalist. Pub. Harper Collins.

⁴² 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.

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 crevices⁴¹.

Brandt's bat is thought to have similar roosting behaviour and foraging ecology to the whiskered bat, however, further research is needed to clarify this⁴¹.

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

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 ⁴³	
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 than 100 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 of 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

⁴³ 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 LEVEL⁴⁴				
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.				

⁴⁴ <https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects#estimate-population-size-class>

APPENDIX 4. BATS ACTIVITY SURVEY RESULTS

Site:	Evistones House				Start	Finish	Date 04.07.18		
Start Time:	21:15	End Time:	23:45	Precipitation :	Dry	Dry	Number of Surveyors:	11	
Sunset Temp °C:	17	End Temp °C:	16	Wind:	F1	F1	Number of Remotes:	1	
Sunset :	21:45			Cloud Cover %:	70%	70%			
Kennels & Garage				Shed		Evistones Cottage			
Roost entrance 1 (R1; bargeboard on southeast elevation), with three entrance points on west, centre and east soprano pipistrelles. 3 non-echolocating bats, 16 x 55, 1 x 45, TOTAL 20 bats				Roost R7 northern gable 1 x non-echolocating bat emerged		Roost entrance 8 (R8; middle of roof on 1B) 1 x 45. TOTAL 1 bat			
Roost entrance 2 (R2; the ridge east side). 1 x non-echolocating bat 1 x Myo, TOTAL 2 bats						Roost entrance 9 (R9 on 1B, in area where dovecot extends out). 2 x 55. TOTAL 2 bats.			
Roost entrance 3 (R3; northeast elevation around roof area). 4 x 55 TOTAL 4 bats						Roost entrance 10 (R10; right side of bay window on roof on eastern elevation of 1C). 2 x non-echolocating bats. TOTAL 2 bats			
R4 entrance (R4; bargeboard on northwest elevation, eastern and western sections) 4 x 55, 1 non-echolocating, TOTAL 5 bats						Roost entrance 11 (R11; on far corner of second storey near flashing on northern elevation of 1C). 1x50, 2x45. TOTAL 3 bats.			
Roost entrance 5 (R5) fascia on northern elevation. 6 x 45. TOTAL 6 bats						Roost entrance 12 (R12; apex window on southern elevation of 1C) with 1 x 55. TOTAL 1 bat.			
Roost 6 (R6; roof apex eaves/soffit on eastern elevation) 1 x 45. TOTAL 1 bat						Roost entrance (R13, the southwest corner of 1E) from 4 tiles down of hipped ridge. 4 x 55. TOTAL 4 bats.			
						Roost entrance (R14; within interior of open-sided southern elevation of 1E). 1 x 55. TOTAL 1 bat.			
In summary, 5 non-echolocating bats, 24 soprano pipistrelles, 6 common pipistrelle bats, 1 Myotis. TOTAL 36 bats, 6 locations.				In summary, 1 roost entrance with a single non-echolocating bat (likely to be a common, soprano pipistrelle or Myotis based on activity at 22:27 emergence time)		In summary, 3 common pipistrelles, 8 soprano pipistrelles, 2 non-echolocating bats and 1 soprano or common pipistrelle (echolocated at 50), TOTAL 14 bats, 7 locations.			
Time	Light Level (Lux)	Surveyor 1		Surveyor 2		Surveyor 3		Surveyor 4	Surveyor 5
21:15	-								
21:20	-								

21:25	-					
21:30	-					
21:35	-					
21:40	-					
21:45	119.3					
21:50	-					
21:55	-	First bat seen not heard (21:58), up to 15 x 45 (22:02), up to 29 x 55 (22:08), up to 3 x Myo. (22:28), noctule (22:39)	1 x bat (no echolocation, 21:58) emerged from R1 under bargeboard	2 x bat (no echolocation @ 21:58, 22:02) emerged from R1 under bargeboard (on southeast elevation, western section)	1 x 55 (21:58)	
22:00	-					
22:05	-		45 (22:37)	A non-echolocating bat emerged from R2 the ridge (east side). Commuting 45 (22:06).	up to 3 x 45 (22:03)	1 x 45 (22:09)
22:10	28.1		5x 55 (22:12, 22:14, 22:15, 22:16, 22:18) from R1. 45 commuting.	A 1 x 45 (22:11), 1 x not echolocating bat (22:20) 5 x 55 (22:13, 22:18) emerged from R1 (centre and eastern area of bargeboard).	5 x 55 (22:11, 22:13, 22:17, 22:20, 22:29 R1 (western, central & eastern section). Up to 3 x 55 foraging.	1 x 55 (22:11) emerged from R3, 1 x bat not echolocating (22:12) and 1 x 55 (22:14) from R4 (bargeboard on northwest elevation, eastern and western sections), 6 x 45 (22:17, 22:18, 22:19, 22:24) from R5 fascia on northern elevation
22:15	14.5					
22:20	9.2					
22:25	-		2 x 55 (no echolocation x1 bat 22:35 assumed to be 55, 22:28 x 55) emerged from R1.	1 x 55 (22:25) from R1 (western section of bargeboard), 1 x not echolocating bat (22:27) from R7 (northern gable of shed).		
22:30	2.8			1 x Myo. from R2 (22:28), 1 x 55 commuting.		
22:35	2.2		up to 7 x 55, up to 3 x 45, Myo. (22:48)	2 x 55 from R1 (22:37)	up to 2 x 55, up to 13 x 45, up to 3 x Myo. (22:43)	numerous 55 and 45, 1 bat not echolocating (22:42), up to 2 x Myo.
22:40	1.3					
22:45	0.9					
22:50	0.6			55		
22:55	0.6					
23:00	0.6		Myo.	45, Myo.		
23:05	0.6					

23:10	0.6						
23:15	0.6			1 x 55 and up to 2 x Myo.	45, 55 & Myo.		
23:20	0.6		Myo., 55.				Myo. & 45
23:25	0.6						
23:30	0.6						
23:35	0.6	45	Myo., 55, 45.				
23:40	0.6	Myo.					
23:45	0.6		Myo.				
Time	Light Level I (Lux)	Surveyor 6	Surveyor 7	Surveyor 8	Surveyor 9	Surveyor 10	
21:15	-						
21:20	-						
21:25	-						
21:30	-						
21:35	-						
21:40	-						
21:45	119.3						
21:50	-						
21:55	-						
22:00	-			2 bats not echolocating (22:03, 22:07) from R10 (right side of bay window on roof on eastern elevation of 1C.	1 x 50 (10:01) for bad heard (not seen),1 x 45 emerged (22:04) from R11 (far corner of second storey near flashing on northern elevation of 1C)	45 (22:01) first bat heard, 1 x 45 (22:04) from R11	
22:05	-	1 x 45 (22:09) emerged from R6 (roof apex eaves/soffit on eastern elevation)	45 & 55 (10:09)	55 (22:11), 45, Myo. (22:17) constantly foraging.		Social calling heard, likely from bats within 1D loft void	
22:10	28.1		3 x 55 from R3 & R4			45, 55	
22:15	14.5		45 foraging				
22:20	9.2						
22:25	-	non-echolocating bat (22:27)	1x45 (22:32) emerged R8 (middle of roof of building ref 1B)				
22:30	2.8		2 x 55 (22:34, 22:36) emerged from R9 on 1B, in area where dovecot extends out. Myo (22:24) and 45 foraging.			45, 55 (22:46), 50 foraging	45, Myo, 55
22:35	2.2	55 (22:35), a non-echolocating bat	55, 45 & Myo. Foraging				
22:40	1.3						
22:45	0.9						
22:50	0.6	55					
22:55	0.6						

23:00	0.6					
23:05	0.6					
23:10	0.6					
23:15	0.6					45, 55, Myo.
23:20	0.6					
23:25	0.6	Myo.			Myo. (23:27)	
23:30	0.6					
23:35	0.6			45		
23:40	0.6					
23:45	0.6					
	Sunset	Times given above detail emergence/possible emergence & first record of each species for each surveyor				
	Emergence					
	Potential Emergence					
	Foraging/commuting					
Time	Light Level (Lux)	Surveyor 11				
21:15						
21:20	-					
21:25	-					
21:30	-					
21:35	-					
21:40	-					
21:45	119.3					
21:50	-	1 x 55 from R12 (apex window on southern elevation of 1C)				
21:55	-	4 x 55 (21:56, 22:03, 22:07, 22:10) from R13 (the southwest corner of 1E from 4 tile down of hipped ridge. 1 x 55 (22:13) from R14 emerging from within interior of open-sided southern elevation of 1E.				
22:00	-					
22:05	-					
22:10	28.1					
22:15	14.5	45 & 55				
22:20	9.2					
22:25	-					
22:30	2.8					
22:35	2.2					
22:40	1.3					
22:45	0.9					
22:50	0.6					
22:55	0.6					

23:00	0.6					
23:05	0.6					
23:10	0.6					
23:15	0.6	Myo. (23:15)				
23:20	0.6					
23:25	0.6	Myo.				
23:30	0.6					
23:35	0.6	Myo.				
23:40	0.6					
23:45	0.6					
	Sunset		Times given above detail emergence/possible emergence & first record of each species for each surveyor			
	Emergence					
	Potential Emergence					
	Foraging/commuting					
Surveyors			KEY			
1	Cassie Bakshani		Common pipistrelle	45	Daubenton's	Daub
2	Rowena Tylden Pattenson		Soprano pipistrelle	55	Noctule	Noc
3	Taryn Rodgers		Nathusius' pipistrelle	39	Serotine	Ser
4	Vince Cassidy		Natterer's	Nat	Leisler's	Nat
5	Barry Bickerton		Whiskered/ Alcathoe/Brandt's	WAB	Brown Long Eared	BLE
6	Phil Dewhurst		Unknown	?	Myotis	Myo
7	Emma Smith					
8	Shona Velazquez					
9	Adam Crolla					
10	Julie Dyson					
11	Hannah Attewell					
Other Species Recorded						

Site:	Evistones House				Start	Finish	Date: 30.07.18	
Start Time:	20:54	End Time:	22:41	Precipitation :	Dry	Intermittent light rain	Number of Surveyors:	11
Sunset Temp °C:	15	End Temp °C:	14	Wind:	F2	F2	Number of Remotes:	2
Sunset :	21:11			Cloud Cover %:	90%	90%		
Kennels & Garage			Shed			Evistones Cottage		

Roost entrance 1 (R1; bargeboard on southeast elevation), with three entrance points on west, centre and east soprano pipistrelles). 17x55, 1xMyo, 9 x non-echolocating bats. TOTAL 27 bats		N/A		Roost entrance 9 (R9 on 1B, in area where dovecot extends out). 1 non-echolocating bat re-entered. TOTAL 1 bat.		
Roost entrance 4 (R4; bargeboard on northwest elevation, eastern and western sections). 6x45. TOTAL 6 bats				Roost entrance (R13, the southwest corner of 1E, from 4 tile down of hipped ridge). 2 non-echolocating bats re-entered. TOTAL 2 bats.		
Roost entrance 5 (R5; fascia on northern elevation from 2 points (left and right)). 5x45. TOTAL 5 bats.				Roost entrance (R14; within interior of open-sided southern elevation of 1E). 1 x non-echolocating bat. TOTAL 1 bat.		
Roost entrance 16 (R16; fascia/wall top). 5x45, 2x non-echolocating bats. TOTAL 7 bats.				Roost entrance 15 (R15; roof of southwest elevation). 1x45. TOTAL 1 bat.		
				Roost entrance 17 (R17; southern elevation of 1C). 2x45. TOTAL 2 bats		
				Roost entrance 18 (R18; under eaves). Emergence of 1 x Myo. TOTAL 1 bat.		
				Roost entrance 19 (R19; wall top 1D). 4x45. TOTAL 4 bats.		
				Roost entrance 20 (R20; ridge of 1D), 1x45. TOTAL 1 bat.		
				Roost entrance 21 (R21; from open-sided section of 1E, north). 1x45, 1x55. TOTAL 2 bats.		
				Roost entrance 22 (R22; ridge next to chimney) 2 non-echolocating bats re-entered, 1 x 45 emerged. TOTAL 2 bats.		
In summary, 17 soprano pipistrelles, 17 common pipistrelles, 1 Myo. and 11 non-echolocating bats. TOTAL 46 bats, from 5 locations.				In summary, 10 common pipistrelles, 1 soprano pipistrelle, 6 non-echolocating bats, 1 Myotis. TOTAL 18 bats from 6 locations.		
Time	Light Level (Lux)	Surveyor 1	Surveyor 2	Surveyor 3	Surveyor 4	Surveyor 5
20:55	-					
21:00	-					
21:05	-					
21:10	-					
21:15	-					
21:20	-	45 (21:20)	55 (09:23)	45 (21:23)	45 first bat	45 (21:20)

21:25		1 x 55 (21:28) emerged from R1 in Garage & Kennels			(21:20). 1 x 45 (21:23) emerged from R15. 13 x 55 (21:29, 21:30, 21:31, 21:40, 21:42, 21:43, 21:48, 21:50, 21:53, 21:54, 22:00), 1 x Myo (21:51) from R1 (apex of bargeboard on western elevation), 1 x pass noc (21:41).				
21:30	-	up to 4 x 55 commuting, Noc(21:41)	55	1 x 9 non-echolocating bats (21:29, 21:32, 21:43, 21:44, 21:45, 21:51, 21:53), 3 x 55 (21:33, 21:41) from R1 (centre and sides of bargeboard), 1 x noctule pass (21:43).		45			
21:35	53.3					1 x 45 (21:38) and 2 x silent bat (21:50) from R16 (fascia/wall top). 4 x 45 (21:38, 21:41, 21:42, 21:43) from R5. 4 x silent bat (21:42, 21:48), 2 x 45 (21:42, 21:50) emerged from R4.			
21:40	18.1 3	1 x 55 (21:42) emerged from R1 in Garage & Kennels	Possible 1 x 55 (21:44) from R1						
21:45	-	55, 45, Noc (1 pass), Myo. Predominantly 55 bat activity.	55 and Myo (21:51 x1 pass). Activity predominantly 55.						
21:50	3.6								
21:55	-								
22:00	1.4								
22:05	-						45 & 55 foraging with a single Myo (22:34)	Mainly 55, with 45 & Myo. Up to 3 silent bats.	45, and silent bats.
22:10	-								
22:15	-								
22:20	-								
22:25	-								
22:30	-								
22:35	-								
22:40	0.6	45 (22:42)							
Time	Light Level (Lux)	Surveyor 6	Surveyor 7	Surveyor 8	Surveyor 9	Surveyor 10			
20:55	-								
21:00	-								
21:05	-								
21:10	-								
21:15	-								
21:20	-	1x45 (21:20) emerged from R5.	1x45 (21:20) emerged from R5.	1 x 45 (21:23)		seen not heard & 45			
21:25				45, 55		2x45 (21:31, 21:41) emerged from R19 (wall top 1D). 1 x 45 (21:32) emerged from R20 (ridge of 1D). 1 x 45 (21:32) from R21 (open-sided section of 1E)			
21:30	-	45, 55 (21:39), noc (21:44)	3 x 45 (21:39) from R16, 4 x 45 (21:42, 21:48) emerged from R4, noc. Pass (21:43)		55 (21:31), 21:32 (45), Myo (21:39)				
21:35	53.3					occasional foraging 45 &			

21:40	18.1 3				1 x Myo (21:56) emergence from R18	Myo.
21:45	-	1 x 45 (21:46) emerged from R16		2 x 45 (21:48) emerged R17 (1C)	55, Myo, noc (21:43)	
21:50	3.6			45, 55		
21:55	-			1 x 45 (21:59) re- entered R17 (1C)	2 x 45 (21:56, 21:59) emerged from R19 (under eaves).	
22:00	1.4					
22:05	-					
22:10	-	45, 55	45, 55, Myo (1 pass 22:01)			
22:15	-					
22:20	-			45, 55, 1 pass by Myo (22:24)	45 including social calls, occasional Myo pass.	
22:25	-					
22:30	-					2 x 45 re- entered R19
22:35	-					
22:40	0.6					
	Sunset		Times given above detail emergence/possible emergence & first record of each species for each surveyor			
	Emergence					
	Potential Emergence					
	Foraging/commuting					
Time	Light Level (Lux)	Surveyor 11	Remote in Evistone Cottage 1D loft void			
20:55	-					
21:00	-					
21:05	-					
21:10	-					
21:15	-					
21:20	-	2 x silent bats (21:21, 21:22) from R22 (interior of 1E, which is open- sided), 1 x 45 (21:31) emerged from R19				
21:25		55, 45				
21:30	-	1 x 45 emerged from R22 (ridge next to chimney)	Myo (21:58)			
21:35	53.3	55, 45				
21:40	18.1 3	1 x silent bat (21:41) from R14				

21:45	-	1 x 55 emerged from R21				
21:50	3.6		Myo			
21:55	-					
22:00	1.4	Anabat not recording from 22:00 to 22:26 as sheltered from rain. However duet still in use.				
22:05	-					
22:10	-	2 x silent bats re-entered R13. 1 silent bat re-entered R9 (where roofs join)				
22:15	-	2 silent bats re-entered (22:13 to 12:15) R22 after swarming at R22				
22:20	-					
22:25	-					
22:30	-					
22:35	-					
22:40	0.6					
22:45	-		Noc (22:47)			
22:50	-					
22:55	-		45 (22:55), Myo. - bat seen flying within void.			
23:00	-					
23:05	-					
	Sunset	Times given above detail emergence/possible emergence & first record of each species for each surveyor				
	Emergence					
	Potential Emergence					
	Foraging/commuting					
Surveyors			KEY			
1	Joe Adams	Common pipistrelle	45	Daubenton's	Daub	
2	Ailsa Hay	Soprano pipistrelle	55	Noctule	Noc	
3	Conor Aynsley	Nathusius' pipistrelle	39	Serotine	Ser	
4	Sophie Smith	Natterer's	Nat	Leisler's	Nat	
5	Dom Hall	Whiskered/ Alcathoe/Brandt's	WAB	Brown Long Eared	BLE	
6	Yura Graboviscia	Unknown	?	Myotis	Myo	
7	Jeanette Bryden					
8	Diana Luke					
9	Ken Wright					
10	Mandy Rackman					
11	Taryn Rodgers					
Other Species		Swallow nest inside 1B				

Recorded	
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