APPENDIX 9.7: BAT BASELINE

1. INTRODUCTION

1.1 Background

1.1.1 Black Hill Ecology Ltd was commissioned by WSP UK Limited (hereafter referred to as WSP) to carry out a bat survey of the Site. This report describes the works undertaken during the identification of bat roosting locations and bat species presence at the Site.

1.2 Bat Ecology

1.2.1 There are 17 species of bat currently resident in the UK. Nine species are known from Scotland[1]. All are believed to be in continuing decline due to threats to highly developed and specialised life cycles. In general, dependence on insects has left UK bats vulnerable to habitat destruction, land drainage, habitat fragmentation, agricultural intensification and increased use of pesticides. Reliance on buildings and decaying trees for roost sites has also resulted in vulnerability to sanitation felling, repairs and the use of timber treatment chemicals.

1.2.2 In the UK, bats are generally active from late-March to mid-October, hibernating from late-October to mid-March. In early Summer, females gather in "maternity" roosts to give birth, normally producing a single offspring per year. This slow rate of reproduction inhibits repopulation in areas of rapid decline. Bats are generally born in June / July and are dependent on their mothers for about six weeks. In Autumn and Winter, male and females gather for mating. The females are able to store sperm until Spring when an egg may be fertilised. In Winter, bats hibernate in sites that have a cool, humid and stable climate. Bats generally return to the same roost sites every year with associated impacts of disturbance or destruction of these sites. Some species of bat move roost frequently and use a number of different roost sites within the same year.

1.3 Legislation

1.3.1 The information below is intended only as guidance to the legislation relating to these species. The Acts themselves should be referred to for the correct legal wording and legal advice sought where required.

1.3.2 All bats are included in Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), which implement the requirements of the Habitats Directive[2] in England, Scotland and Wales.

1.3.3 It is an offence for anyone without a licence to:

- Intentionally or recklessly/deliberately injure, take or kill a bat;
- To possess a bat (unless obtained legally) whether alive or dead;
- Intentionally or recklessly/deliberately damage, destroy or obstruct access to any place that bats use for shelter or protection whether bats are present or not;
- Intentionally or recklessly/deliberately disturb a bat while it is occupying a structure or place that it uses for shelter or protection;
- deliberately disturb bats in such a way as to be likely significantly to affect—
  - i. the ability of any significant group of bats to survive, breed, or rear or nurture their young; or
  - ii. the local distribution or abundance of that species.

1.3.4 Prosecution could result in imprisonment, fines per animal affected and confiscation of vehicles and equipment used.

1.3.5 Exemptions can be granted from the protection afforded to bats under the Habitat Regulations, by means of an European Protected Species (EPS) Habitats Regulations licence obtained from Scottish Natural Heritage.

1.3.6 An 'EPS Habitats Regulations Licence' could be required for:

[1] Harris, S. & Yalden, D. (2008). Mammals of the British Isles. 4th Edition. The Mammal Society.

[2] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Available online at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A01992L0043-20130701

- Removal of trees known to be used by bats as well as tree pruning;
- Significant alterations to roof voids known to be used by bats;
- Road building or widening; and
- Bridge strengthening.

1.3.7 There are three tests, which must be satisfied, before a licence can be issued to permit otherwise prohibited acts;

- Regulation 44(2)(e), for the purpose of preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment; or 44 (2)(f) for the purpose of preventing the spread of disease; or 44(2)(g) for the purpose of preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other forms of property or to fisheries; subject to Scottish Natural Heritage being satisfied that the application additionally meets:
- Regulation 44(3)(a) that there is no satisfactory alternative; and
- Regulation 44(3)(b) that the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range.

1.3.8 An EPS Licence is required before the commencement of any development that requires one due to its impact on bats or their roosts.

2. SITE SURVEY AND ASSESSMENT

2.1 Pre-existing information on bat species at the Site

2.1.1 The National Biodiversity Network (NBN) Atlas[3] holds a single bat record for Leisler's Bat (*Nyctalus leisleri*) from a static detector within 2 km of the Site.

2.1.2 A Daytime Bat Walkover (DBW) was carried out by WSP in October 2023 and provided a guideline for surveyor effort. Buildings on Site were assessed as moderate (buildings with stone or block walls with slate or tile roofs) or low (derelict ruined buildings without roofs or buildings with sheet roofs) potential roost suitability and individual trees were identified if potential roost features (PRFs) were present.

2.2 Objective(s) of survey

2.2.1 Based on the results of the previous DBW undertaken, the surveys detailed in this report set out to assess the following:

a) whether or not bats were using roosts within the Site;

b) what species of bat were present at the Site; and

c) what types of bat roosts were found within the Site.

2.3 Survey area description

2.3.1 The Site consists of the natural and built environment around the derelict Mains of Greens Farmhouse, Turriff. The Site consists mostly of lowland improved farmland enclosures, with field boundaries bordered by scrub and occasional individual broadleaved trees or small areas of broadleaved woodland and small watercourses and field drains. It was considered that all bat species local to northeast Scotland may be encountered at this Site.

2.3.2 Individual broadleaved trees and branches on site were identified by WSP, and given an individual tree tag number, to have bat roost potential due to presence of PRFs. Farmhouse, cottages, steadings, sheds, outbuildings and field shelter onsite are potentially suitable for use by roosting bats (e.g. **Figure 9.7.1-9.7.4**). Open sheds, woodland, trees / tree lines and open areas with livestock and woodland / tree / scrub edge particularly associated with watercourses potentially have value for foraging bats.

Figure 9.7.1 Mains of Greens Farmhouse

[3] National Biodiversity Network (NBN) Trust (2024). The National Biodiversity Network (NBN) Atlas. hsps:// ror.org/00mcxye41.1

Figure 9.7.2 Parks of Greens Farmhouse

Figure 9.7.3 Derelict Cottage

Figure 9.7.4 Private Water Supply (PWS) access point

2.4 Field Survey

Methods

Day Survey

2.4.1 On the 7 June 2024, 28 June 2024 and 19 July 2024 the buildings and trees at the Site were surveyed for potential roost sites and signs of bats. The day survey utilised high-powered torches from ground level, hand held endoscope for inspection of tree cavities and binoculars for use in buildings with large openings and exposed roof materials (see **Figure 9.7.5**). The inspection involved looking for bat droppings on the ground, stuck to sheets/slates, in crevices/tree bark and recording suitable entry and exit points. On the nights of the 7 June 2024, 13 June 2024, 17 June 2024, 25 June 2024, 28 June 2024, 4 July 2024, 15 July 2024, and 16 July 2024 dusk emergence bat detector surveys were carried out at buildings at the Site to identify and provide a population estimate of any bats present. Each building onsite was allocated to one of four survey blocks, each block surveyed on a different night with repeat surveys at three weekly intervals (**Annex B**).

Dusk Emergence Surveys

2.4.2 On the survey nights dusk emergence surveys were carried out at the Site were carried out to visually observe bats emerging from roost sites and if present confirm species identify. Each survey location requiring repeat survey was surveyed at a minimum of three week intervals as per Bat Conservation Trust (BCT) guidelines[4] (see **Figure 9.7.6**). Dusk surveys began 30 minutes before sunset and continued for one and a half hours after sunset. Bat surveyors were stationed around surveyed buildings using hand held bat detectors (Pettersson D1000x, Pettersson D980, BatBox Duet and Wildlife Acoustics Echo Meter Touch 2) with the assistance of infrared and thermal imaging Night Vision Aids (NVAs) (Panasonic AG30 Infrared Cameras, Nightfox Swift Infrared goggles, FLIR Thermal Imagers, **Annex B**). Surveyors positioned themselves so the potential roost structures remained in the detection envelope of bat detectors at all times and bats emerging from all aspects would be observed and detected, with surveyors maintaining contact through two-way radios (Motorola T80s) relaying the time of first contact with bat species and info on bat activity to determine whether bats emerged from roosts on Site or travelled on Site to observer locations.

2.4.3 After the emergence surveys concluded transects were walked, back to vehicles, adjacent to linear features in order to identify key foraging areas, flight paths and potential alternative roosts used by bats, if present.

Figure 9.7.5 Potential Roost Features accessed

[4] Collins J. (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines. 4th Edition. Bat Conservation Trust, London.

Weather conditions

2.4.4 The temperature at the start of the night surveys was over 10°C on all occasions; there was between 10% and 100% cloud cover and through the survey periods wind speed varied but was generally low. On most nights there was no rain, with light intermittent rain during survey visits on some nights. The weather conditions were considered suitable for appropriate Summer bat surveys and not considered to impede the surveys in any way.

Personnel

2.4.5 All work was carried out by experienced tree / ladder climbers and licensed bat workers (Iain Mackie and R Smart: Roost Conservation Licence 152739) with the assistance of experienced bat surveyors (EM, JS, AB, MMS) with over five decades of combined experience surveying bats. Lead surveyor Iain Mackie is a recognised expert on bats having a PhD in bat conservation biology and multiple published papers in bat ecology.

Limitations

2.4.6 The survey included daylight walkover, passive automatic ultrasound recorders and multiple dusk surveys carried out by multiple surveyors to BCT guidelines. The results of the emergence surveys were similar to the passive bat recorder data suggesting a good understanding of bats species utilising the Site. The surveys were carried out over an appropriate time frame and during a time of year where maternity roosts are established and so would be identified if present. Due to the poor condition of the buildings, internal inspections were not conducted. Additionally, some areas around the buildings posed trip hazards and contained hazardous materials, such as asbestos sheeting, which prevented close approach. However, due to the open nature of the majority of the Site surveyors had a clear view of buildings and coupled with low diversity of bat assemblage it is considered that roosting bats would be identified if present. As such this assessment is considered to be robust.

2.4.7 Ecological survey data for mobile species is typically valid for 18 months unless otherwise specified, for example, if conditions are likely to change more quickly due to ecological processes or anticipated changes in land management[5].

2.5 Results

Day Survey

2.5.1 All trees and buildings at the Site were surveyed for physical evidence of use by bats. Trees with PRF – Ms (i.e. PRFs suitable for multiple bats which may therefore support a maternity colony) conferring roost potential for groups of bats (see **Volume 3, Figure 9.2.3c Bat PRA Tree Locations**) were accessed three times over a six week period and repeated endoscope survey of tree crevices found no evidence of use by bats (**Annex A**).

Dusk Emergence Surveys

2.5.2 Common pipistrelles, *Pipistrellus pipistrellus*, were the first bats to emerge or arrive on Site followed by Soprano pipistrelles, *Pipistrellus pygmaeus*. A pipistrelle bat, identified as *Pipistrellus pipistrellus* by the peak frequency of echolocation calls recorded, emerged from a farmhouse building in the Mains of Greens (Code A -1) at 17 minutes after sunset on the 28 June 2024 (see **Table 9.7.1** and **Figure 9.7.6**, Roost A). The bat is assumed to roost in crevices between building materials at the location identified in **Figure 9.7.9**. No roosting bats were recorded at any of the other buildings. Commuting and feeding bats of two species were recorded across or adjacent to the Site throughout the survey periods (see **Figures 9.7.7 and 9.7.8**) and a single key foraging area was identified where repeated, sustained bat foraging activity was recorded.

[5] CIEEM (2019). Advice note on the lifespan of ecological reports and surveys. Available: https://cieem.net/resource/advice-note-on-the-lifespan-of-ecological-reports-and-surveys/ [Accessed: February 2023].

Figure 9.7.6 Plan of Mains of Greens including surveyor locations (black circles), roost (red circle) and areas of higher bat activity (green rectangles) for Farmhouse, East Steadings and Sheds Block

Figure 9.7.7 Plan of Mains of Greens including surveyor locations (black circles), roost (red circle) and areas of higher bat activity (green rectangles) for Farmhouse, East Steadings and Sheds Block for West Steadings Block

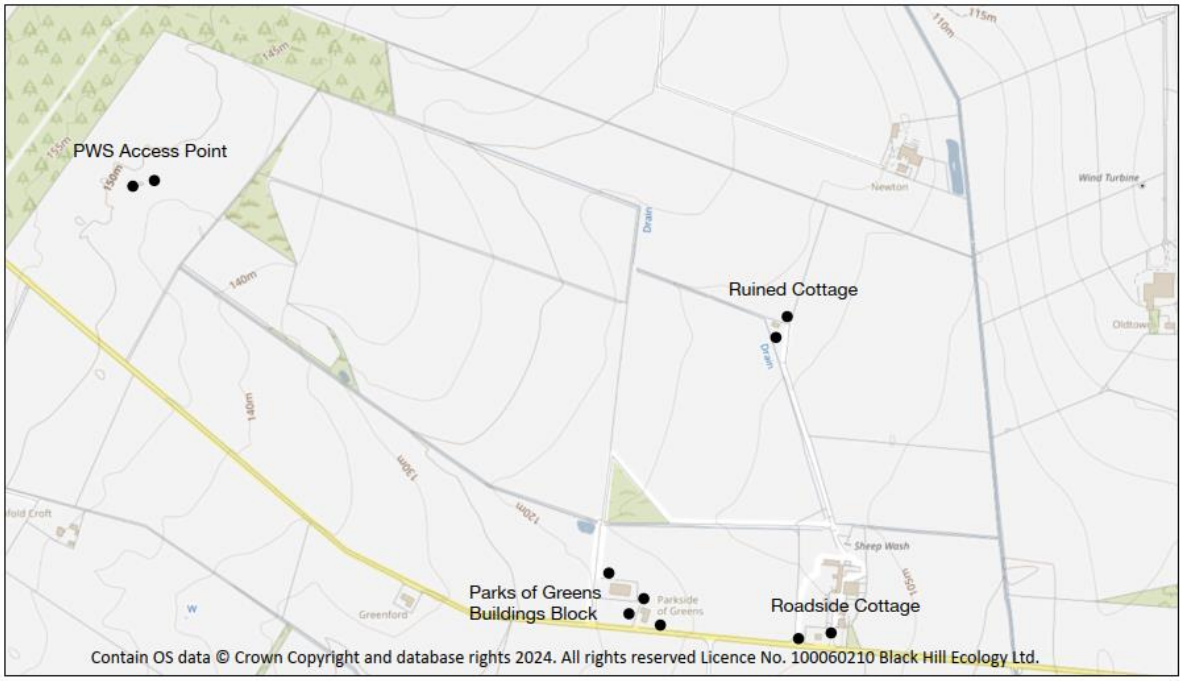


Figure 9.7.8 Plan of the Site including surveyor locations (black circles) for cottages (A-7 and B-1), Parks of Greens buildings and PWS access point

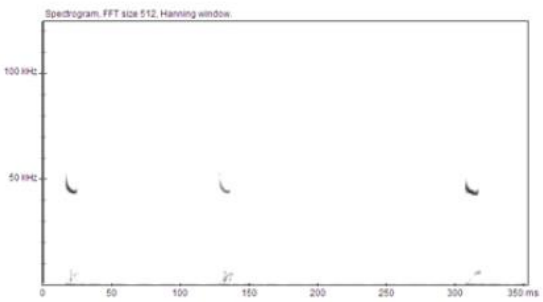


Figure 9.7.9 Echolocation calls of *P. pipistrellus* emerging from roost in Mains of Greens Farmhouse (blue arrow)

Table 9.7.1 Bat roosts identified and characterised by species and type

Roost	Species	Roost Type	Structure	Max Number
Roost A	P. pipistrellus	Non-maternity day roost	Building	1

3. CONCLUSIONS

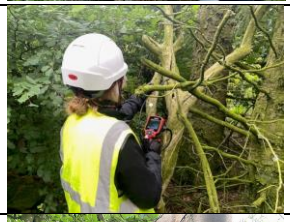
3.1 Conclusions

3.1.1 The Site contained habitats (open sheds, woodland, trees / tree lines and open areas with livestock and woodland / tree / scrub edge and watercourses) potentially of high value for foraging, commuting and roosting bats.

3.1.2 A minimum of two species of bat were recorded utilising the Site. Dusk emergence surveys observed use of a roost in a building by one species of bat at the Site. No bats or signs of bats roosting were observed or recorded at any other part of the built or natural environment at the Site, however, the species of bat recorded on Site are known to roost in buildings and therefore may be present in any suitable gaps available on Site.

3.1.3 No echolocation calls from bat species of the myotis or plecotus genera were recorded over the Site by surveyors.

ANNEX A: TREE PRF SURVEY

Structure Survey Code (Tree)	Dates Surveyed	Tree Species	Image Site Check	Image Endoscope
T - 0110	20240607, 20240628, 20240719.	Sycamore		
T - 0113	20240607, 20240628, 20240719.	Willow		
T - 0115	20240607, 20240628, 20240719.	Broken Branch		
T - 0116	20240607, 20240628, 20240719.	Ash		
T - 0123	20240607, 20240628, 20240719.	Sycamore		
T - 0124	20240607, 20240628, 20240719.	Sycamore		
T - 0126	20240607, 20240628, 20240719.	Sycamore		

ANNEX B: BUILDINGS SURVEY

Structure Survey Code (Block)	Dates Surveyed	Structure	Image 1	Image 2
A - 1 (Block 1)	20240607, 20240628.	Farmhouse		
A - 2, 3, 4, 5, 6 (Block 1 East Steadings, Block 2 West Steadings)	20240607, 20240613, 20240628, 20240704.	Farm Buildings		
A - 7 (Block 3)	20240617, 20240715.	Roadside Cottage		
B - 1 (Block 3)	20240617, 20240715.	Ruined Cottage		
C - 1 (Block 3)	20240617, 20240715.	PWS access point		
F - 1 (Block 4)	20240625, 20240716.	Parkside of Greens		
E - 1 (Block 4)	20240625, 20240716.	Parkside of Greens Shed