



Urban Tree Experts

BS5837 – Tree Surveys – Ecological Consulting

ECOLOGICAL SURVEY REPORT (BATS) AT WEST GREYLAKE RISELEY



**Prepared for:
Mrs C Ashford
West Greylake
Part Lane
Riseley
Reading RG7 1RU**

16 September 2024

Ref: SPH/ESR-24/30.08



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The validity of this report ceases at the prescribed time limit or after one year from the survey, or if the site conditions change due to unspecified works that affect the site whichever is the sooner.



EXECUTIVE SUMMARY

Urban Tree Experts were initially commissioned by Mrs C Ashford to carry out three dusk emergence surveys at West Greylake, Part Lane, Riseley, Reading, RG7 1RU. The surveys were undertaken on the property and shed to provide further evidence to support the initial findings and conclusions from the preliminary ecological appraisal (DBW), ref SPH/PEA-24/06.05, and to inform appropriate mitigation for the proposed works.

This report is prepared to support a forthcoming planning application to Wokingham Borough Council the final details are unknown but are likely to include the re-siting/demolition of the shed, conversion of the garage into habitable accommodation, and link extension connecting the garage to the house.

The application site comprises a detached, brick-built property with a two-storey detached garage and wooden shed. The remainder of the site comprises a gravel driveway/parking area, a front garden laid to lawn and a rear garden, which is mainly laid to lawn with some trees, hedgerows and shrubs throughout. The site itself offers good foraging and commuting habitat for bats and there is direct ecological connectivity to the wider landscape that also provides a diverse habitat for foraging and roosting bats.

The preliminary ecological appraisal consisted of a desk top study prior to the survey to review existing information about the site and its surroundings and to inform the design of subsequent bat surveys, if required. The desk top study was conducted based upon a minimum 2km search radius and it revealed three statutory designated sites are located within, and no current European Protected Species Licences (EPSLs) for bats have been granted within 2km of the proposed development site.

A search of the Berkshire and South Buckinghamshire bat group records confirmed 9 different species within the 2-kilometer search radius, including *Myotis sp.*

The preliminary ecological appraisal (bats) comprised a detailed search of the interior and exterior of the buildings for bats, signs of bats and features suitable for use by roosting bats. This includes droppings, internally or externally, scratch marks, rubbing and staining at exit holes, live or dead bats and the features such as missing tiles, this list is not exhaustive.

The initial site visit was carried out on by Simon Holmes on Wednesday 5 June 2024 at 1.30pm. An internal and external inspection of the buildings took place to look for signs of bats.

Externally and internally the property, garage and shed were found to be in a good condition however there are a small number of gaps within the verges on the property and within the roof of the shed which could provide potential roosting opportunities or access into the buildings for bats. In addition, a small number of bat droppings were recorded externally on the gable end of the house and on the shed window that were of a similar size and consistency to those of *pipistrelle spp.* bats, indicating that bats are or have been using the buildings for roosting. DNA testing of a sample of the droppings by SureScreen Scientifics confirmed the droppings to be those of the common pipistrelle bat, see Appendix 1.

Full access was provided to the buildings and there were no constraints to the surveys.



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In line with best practice guidelines, three activity surveys were recommended to provide additional evidence in support of the preliminary survey result and the amount of effort is considered proportionate to the property and risk associated with the proposed works.

The activity surveys were conducted on Friday 12 July, Wednesday 7 August and Friday 30 August 2024.

A number of bats were heard and seen foraging in and around the site throughout the surveys and, at 21.35, during the first emergence survey, a soprano pipistrelle bat was seen and recorded emerging from 1/3 the way down the left-hand soffit on the southwest gable end of the property. During the second and third emergence surveys, at 20.58 and 20.13 respectively, on each occasion an individual soprano pipistrelle bat was recorded emerging from a gap, in the centre of the ridge covering, on the southwest facing roof elevation of the shed.

This report confirms the findings of the surveys, completed by an experienced licensed bat ecologist, in accordance with current best practice guidance where possible, and outlines any ecological constraints or issues with the proposed works.

In the absence of mitigation, demolition of the shed and the construction of a linking section between the property and converted garage will result in the destruction of the day roost for a low number of soprano pipistrelle bats (minimum 3). However, following works there is no reason why continued roosting provision cannot be successfully maintained with appropriate mitigation and/or enhancement. An EPSL must be obtained from Natural England before works commence to the buildings.

An outline method statement has been included to enable the Local Planning Authority to have regards to the requirements of the Habitats Directive... *“in the exercise of their functions in considering the planning application”*. A full method statement will be prepared as part of an EPSL application to be submitted to Natural England.



1. Introduction

1.1 Instruction

Urban Tree Experts was commissioned by Mrs C Ashford to carry out three dusk emergence surveys at West Greylake, Park Lane, Riseley, Reading, RG7 1RU.

1.2 Aims and Objectives

The dusk emergence surveys are designed to:

- Identify the presence/likely absence of bats using the buildings to roost.
- Estimate the size and status of any existing bat roost within the buildings.
- Establish where the bats are accessing the buildings.
- Determine the potential impacts on any bat roost from the proposed development.
- Determine if an EPSL and ecological method statement is required.

The survey was carried out in accordance with Bat Surveys for Professional Ecologists Good Practice Guidelines 4th edition.

1.3 Proposed Works

The surveys were commissioned in connection with a forthcoming planning application to Wokingham Borough Council the final details are unknown but are likely to include the re-siting/demolition of the garden shed, conversion of the garage into habitable accommodation, and link extension connecting the garage to the house.

1.4 Surveyor Background and Experience

The activity surveys were conducted by Robert Brittain and Nick Powell and a remote camera, and the report was compiled by Simon Holmes MSc. CEnv, a Natural England licensed bat ecologist.

Simon holds Class 3 (CL19) and 4 Bat (CL20) Licenses (Nos. 17637 and 17638) and Science and Education license (SCI64844). He has 33 years' experience of carrying out bat surveys and bat conservation work.

Robert (Bob) Brittain. Bob holds a Class 2 Bat Licence (CLS-11916) and has been surveying bats for 12 years with various ecological consultancies and has received training in surveying techniques, bat detector use, bat biology, identification, acoustic monitoring, echolocation analysis and netting.

Nick commenced surveying bats in 2022 and holds a Class 2 Bat License (CLS-11742) and has received training in bat ecology and surveying, bat detector use, acoustic monitoring/sonogram analysis, architectural terms for bat workers, bats and development, H & S awareness for bat workers, legislation for bat workers, British bats their ecology and conservation, surveying trees for bats, Bat ID and handling, bat biology.

2. Survey Methodology

2.1 Constraints/Limitations

An assessment of the buildings' exteriors was conducted on 12 July 2024, prior to the first survey being conducted and there were no material changes to the buildings and no constraints or limitations to the surveys. The weather conditions at the time were appropriate for bat activity surveys and bats were observed emerging, foraging and in transit during the surveys.



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2.2 Dusk Surveys

The dusk emergence surveys were conducted on the evenings of Friday 12 July, Wednesday 7 August and Friday 30 August 2024. The surveys were at a time of year when bats are most likely to be present and the weather conditions were suitable for the surveys being conducted during warm weather and when insect abundance was plentiful.

The surveyors were stationed (as shown in Figure 1), to ensure the features identified in the preliminary ecological appraisal (DBW) could be observed. Sample screenshots from the video cameras are included at Appendix 2.

During the surveys, bat activity was monitored using two BatLogger M bat detectors together with three Sony Handycam night shot video cameras with high intensity IR lamps. The detectors and cameras were fitted with SD cards for recording bat activity, allowing for later analysis with Kaleidoscope Pro 3 software and VLC media player and DVR Scan.

Figure 1 – West Greylake, Riseley, surveyor locations and emergence directions.



At 21.35, during the first emergence survey, a soprano pipistrelle bat was seen and recorded emerging from 1/3 the way down the left-hand soffit on the southwest gable end of the property. During the second and third emergence surveys, at 20.58 and 20.13 respectively, on each occasion an individual soprano pipistrelle bat were seen and recorded emerging from a gap, in the centre of the ridge covering, on the southwest facing roof elevation of the shed. In total four different species were recorded and identified foraging and commuting around the site. A simple summary of the bats recorded can be seen in Table 2 commencing on page 7.



3. Survey Findings

3.1 Dusk Surveys

The weather conditions and surveyor details from the surveys can be found in Table 1 below.

Table 1 – Surveyor details and weather conditions for bat activity surveys conducted at West Greylake, Riseley.

Date:	12 July 2024	7 August 2024	30 August 2024
Surveyors and locations	(A) Bob Brittain (B) Nick Powell (C) Remote camera	(A) Bob Brittain (B) Nick Powell (C) Remote camera	(A) Bob Brittain (B) Nick Powell (C) Remote camera
Weather Conditions (Start)	Temperature 13.8°C, Cloud cover 95% Humidity 69.5% Dry Wind Beaufort 0	Temperature 14.5°C, Cloud cover 50% Humidity 73.6% Dry Wind Beaufort 2-3	Temperature 15.3°C, Cloud cover 20% Humidity 66.3% Dry Wind Beaufort 0-1
Sunset/Sunrise	21:19	20:41	19:53
Start time	21:00	20:25	19:35
Finish Time	23:10	22:15	21:25
Duration	02:10	01:50	01:50
Weather Conditions (Finish)	Temperature 11.5°C, Cloud cover 90% Humidity 85.1% Dry Wind Beaufort 0	Temperature 12.5°C, Cloud cover 30% Humidity 84% Dry Wind Beaufort 1-2	Temperature 12.2°C, Cloud cover <5% Humidity 81.6% Dry Wind Beaufort 0-1

Table 2. Summary of bat calls recorded in the vicinity of West Greylake, Riseley.

Date	Surveyor Position	Time	Seen	Heard	Species	Comments
12/07/24	A	21:00 – 23:10	Y	Y	Common and soprano pipistrelle, noctule and brown long-eared (BLE)	At 21.35 (16 minutes after sunset) a soprano pipistrelle bat was seen and recorded emerging from 1/3 the way down the left-hand soffit on the southwest gable end of the property. Thereafter limited and sporadic soprano pipistrelle bats were both seen and heard in transit and foraging around the site until survey end. Common pipistrelle activity commenced at 21.57 with the bat being seen in transit across the front of the property and garage and thereafter their activity dominated until survey end with numerous calls being heard and recorded. 2 calls from a noctule were heard, at 21.56 and 22.42, the bat was not seen. A BLE bat was heard on 2 occasions, at 22.54 and 23.03.
12/07/24	B	21:00 – 23:10	Y	Y	Common and soprano pipistrelle and noctule	At 21.37 a soprano pipistrelle bat was seen and recorded in transit between the property and shed, heading towards the surveyor. Thereafter limited soprano pipistrelle activity was heard until 21.54. Common pipistrelle activity commenced at 21.58 with the bat being seen foraging in the garden to the left of the surveyor. Common pipistrelle foraging activity dominated until survey end with the bat being seen only once more, at 22.02. A noctule was heard on 4 occasions between 21.40 and 22.42, the bat was not seen.
12/07/24	C	21:00 – 23:10	Y	N	Remote camera only	The camera recorded bats in transit between the property and garage during the survey.



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Table 2. Summary of bat calls continued:

Date	Surveyor Position	Time	Seen	Heard	Species	Comments
07/08/24	A	20:25 – 22:15	Y	Y	Common and soprano pipistrelle and BLE	At 20.59 (18 minutes after sunset) a soprano pipistrelle was seen in transit from behind the surveyor and over the garage to the right. Very limited soprano pipistrelle foraging activity was then heard and recorded until 21.51 with the bat being seen only once again, at 21.02. Once again common pipistrelle foraging and transit activity dominated from 21.12 (when the bat was seen in transit from the rear to the front garden over the shed) until 22.14. The bat was seen on a couple of occasions foraging in and around the site. A single call from a BLE bat was heard at 22.01.
07/08/24	B	20:25 – 22:15	Y	Y	Common and soprano pipistrelle, noctule and BLE	At 20.58 an emergence call from a soprano pipistrelle was heard with the bat being seen almost immediately thereafter to the left of the surveyor. Thereafter limited and sporadic soprano pipistrelle activity was heard and recorded until 21.33 with the bat being seen only once again, at 21.13, foraging to the left of the surveyor. Common pipistrelle activity dominated from 21.12 (when the bat was seen in transit from behind the surveyor hearing towards the front of the property) until survey end with the bat being seen on a couple more occasions foraging in and around the site. A single call from a noctule was heard at 21.22 and a couple of faint calls from a BLE bat were heard at 22.01 and 22.03.
07/08/24	C	20:25 – 22:15	Y	N	Remote camera only	At 20.58 (17 minutes after sunset) an individual soprano pipistrelle bat was seen and recorded emerging from a gap, in the centre of the ridge covering, on the southwest facing roof elevation of the shed.
30/08/24	A	19:35 – 21:25	Y	Y	Common and soprano pipistrelle and noctule	At 20.14 a soprano pipistrelle bat was both seen and heard in transit from behind the surveyor heading towards the rear garden and thereafter a number of foraging calls from soprano pipistrelle bats were heard and recorded until survey end with the bat being seen in transit between the front and rear garden on a couple of occasions. Once again common pipistrelle activity dominated with numerous foraging and transit calls being heard from 20.21 until survey end. The bat was seen and heard foraging and in transit in and around the site. A number of foraging calls from a noctule bat were heard and recorded between 20.25 and 20.27.
30/08/24	B	19:35 – 21:25	Y	Y	Common and soprano pipistrelle and noctule	At 20.13 a call from a soprano pipistrelle bat was heard and, 20.14 a soprano pipistrelle bat was both seen and heard in transit from the front to the rear garden and past the surveyor. At 20.15 a common pipistrelle bat was both seen and heard in transit from the front to the rear garden and thereafter both common and soprano pipistrelle foraging and transit activity sporadically continued until survey end with the bats being seen foraging in and around the site and garden. 19 foraging calls from a noctule were heard between 20.16 and 20.26, the bat was not seen.



Table 2. Summary of bat calls continued

Date	Surveyor Position	Time	Seen	Heard	Species	Comments
30/08/24	C	19:35 – 21:25	Y	N	Remote camera only	At 20.13 an individual soprano pipistrelle bat was seen and recorded emerging from a gap, in the centre of the ridge covering, on the southwest facing roof elevation of the shed.

4. Conclusions/Interpretation

- 4.1 The evidence collated from the preliminary inspection and bat activity surveys provides a high level of confidence in support of the opinions as set out in this report. During all three emergence surveys bat roosting was confirmed when soprano pipistrelle bats emerged from both the property and shed, there is no evidence of maternity roosting at the site. The combined evidence indicates that the property and shed hosts day roosts for soprano pipistrelle bats (<3), a common (widespread in the UK and Berkshire) species (that is not a hibernation site). The roosts are considered to be of low conservation significance that is important at a site level only.
- 4.2 The local bat group records, surveyor observations and recordings provide a high level of confidence in the species detected at West Greylake.
- 4.3 The calls detected and recorded from the survey provided identification of common pipistrelle, *Pipistrellus pipistrellus*, soprano pipistrelle, *Pipistrellus pygmaeus*, brown long-eared, *Plecotus auritus*, and noctule, *Nyctalus noctula*, all foraging and/or transiting across the site. The longest and most frequently recorded calls and observations were from common pipistrelle bats.
- 4.4 The property and shed have features suitable for crevice dwelling bats to roost, for example pipistrelle and BLE bats and the surrounding land with tree and hedgerow lined agricultural fields, freshwater lakes and Wellington Country Park provide excellent foraging and roosting opportunities for a wide range of bat species.
- 4.5 The bat activity was dominated by common pipistrelles, with calls and visual observations indicating a low number of individuals across the surveys. With the good foraging conditions this season (2024) the bat activity encountered during the surveys is considered low. All activity surveys in the county this season have resulted in low levels of bat activity despite favorable foraging conditions.
- 4.6 Whilst a limited number of calls from BLE bats were recorded and/or heard by the surveyors, this is not unusual as the BLE bat is commonly referred to as the 'silent' bat as the calls are very quiet and difficult to detect as they prefer to hunt using their hearing and sight.
- 4.7 The proposed work will lead to the destruction of 2 day roosts of soprano pipistrelle bats and if unsupervised bats may be killed resulting in a moderate negative impact at a local level. The cumulative evidence leads me to conclude that an EPSL is required for the works at West Greylake. Mitigation measures (against the risk of disturbance, killing or injuring bats during the work), and compensation measures (to provide continued bat roosting provision at the site) must be implemented as a condition of any planning consent.



- 4.8 An outline method statement has been included to enable the Local Planning Authority to have regards to the requirements of the Habitats Directive... *in the exercise of their functions in considering the planning application.*
- 4.9 All bats and their roosts are protected under the Conservation of Habitats and Species Regulations 2017, and the Wildlife and Countryside Act 1981 (as amended). The provisions in the Method Statement must be implemented in order for the works to be legally undertaken and must form part of any planning conditions.

5. Method Statement for Planning

- 5.1 This method statement aims to address:
- Timing and methods of activities
 - Provision of new bat roosts
 - Impact on and replacement of existing roosts
 - Lighting and habitat provisions as applicable

5.1 Pre-commencement

- 5.1.1 A project ecologist must be engaged prior to work commencing on the property and shed to provide advice should it be required. This ecological method statement must be adhered to, it provides project supervision and guidance to ensure that best practice and compliance is adhered to and may prevent a criminal offence being committed. If there is a delay of greater than one year from the date of this report, further survey effort will be required. Bats are highly mobile wild animals and may be encountered within a building following negative survey results.
- 5.1.2 The mitigation strategy must include the erection of alternative roosting provision before work commences at the site. This may take the form of, but is not restricted to bat boxes, for example 2 number Schwegler 1FF bat boxes (see www.NHBS.com), will be suitably affixed on a mature tree on the site or on the undisturbed end of the garage at a minimum height of 4.5 metres. The exact siting to be agreed with the project ecologist. This type of bat box provides alternative roosting habitat for the species roosting on this site, should it be required. The boxes must remain in situ once all work has been completed and will contribute to a biodiversity net gain for the site.

5.2 Method

5.2.1 Prevention of injury

A toolbox talk will be given to contractors prior to commencement of works on the gable end of the property or works to relocate the shed, which will include: background legislation in relation to bats; the most likely areas to expect bats (behind soffits/fascias and ridge coverings), good working practice and, details of what to do if a bat or additional evidence of bats is discovered. In the unlikely event that bats, or evidence of other roost locations are found, works must stop, and the project ecologist contacted, and any license modification obtained.

5.3 Ecological supervision

- 5.3.1 Records of any site visits must be made by the project ecologist, and photographs must be taken as required in order to ensure compliance with this method statement.



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- 5.3.2 Prior to any works on the property or shed they are to be inspected for any new evidence of bats and the project ecologist must be available (on-call) to provide advice.
- 5.3.3 If, during the work, when the project ecologist is not on-site, and a bat is discovered that appears to be injured or distressed, then the animal should be carefully placed in a small box (e.g. shoe box) by either handling the bat with thick gloved hands or covering the bat with the box and sliding a thin piece of cardboard under to create a floor to the box. A clean piece of cloth loosely crumpled will be placed in one corner of the box (to allow the bat to crawl under and hide), a few small air holes will be put into the lid of the box, and a very shallow container (e.g. foil milk bottle top) of water will be placed in one corner of the box. The licensed bat worker must then be called without delay and all work must stop until the licensed bat worker has been consulted.
- 5.3.4 High risk works (removal of ridge covering on the shed and soffits on the property, where bats are known to have roosted) must be directly supervised by the project ecologist who must be a licensed bat ecologist and shall follow a 'soft-strip' method, requiring a visual inspection of the underside of the materials before removal.

5.4 Timing of work

- 5.4.1 Any work to the existing soffits/fascias on the property or roof of the shed have the potential to disturb bats during the bat activity period (1 May to 31 August) and therefore roofing works must be conducted outside this period. If the works cannot be undertaken during the period 1 September to 1 May and should bats be encountered during this period or at any time during the work, then all work must stop and the ecological clerk of works called for advice.
- 5.4.2 All work must be undertaken in normal working, daylight, hours, which is in accordance with best working practice and allows the project ecologist to address any issues if bat(s) are found during the demolition work.
- 5.4.3 When the soffits/fascias or the shed roof require stripping back the work must only be conducted when the air temperature is sufficiently high (at least 8°C) so as to not risk harming bats which may be found. If bats are located during any aspect of the building work all work must stop and the project ecologist must be contacted immediately for advice.

5.5 Incorporation of bat roosting

- 5.5.1 The existing roost access consists of gaps soffits/fascias on the property and gaps in the ridge material on the shed. Access to suitable roosting provision must be compensated for in the proposed linking extension. The linking extension must provide suitable crevice like features, for example integral bat boxes in the soffits at eaves level, or between the joists and combined with a bat access tiles. The compensation measures must be positioned on south or east facing elevations but not directly above a window. Suitable alternatives would include bat bricks where access is possible or bat access tiles at the ridge and where they provide access to the roof. Only Non-Bitumen Coated Roofing Membranes (NBCRM) that has passed the snagging propensity test should be used in relation to the bat access or bat roosts as they do not entangle bats.



5.6 Lighting proposals

- 5.6.1 Lighting: The exact lighting proposals are not known at this stage but where new external lighting is provided best practice in the form of Bats and Artificial Lighting At Night Guidance Note GN08/23 (Bat Conservation Trust and Institution for Lighting Professionals) must be followed.

Research into artificial lighting at night (ALAN) has identified a reduction in insect diversity at night and the potential to disrupt a broad range of insect behaviour patterns and in turn foraging opportunities for bats, particularly where they are bright white. It is therefore essential that any new external lighting is carefully selected, for example, all external lighting must be Light Emitting Diode (LED) and directed downward or be located at a low level. By carefully directing light downwards and using a PIR with short illumination sensor the impact of external lighting on any foraging bats can be reduced.

5.7 Post construction work

- 5.7.1 Monitoring: There is no requirement for monitoring visits with this scheme.

6. Summary

- 6.1 The gaps under the ridge material on the shed and the gaps in the soffits on the property provide crevice like features suitable for crevice dwelling bats to roost. One species was identified as having roosted at the property and shed, soprano pipistrelle bats. The activity surveys identified a low number of soprano pipistrelle bats foraging across the site. On the basis of the evidence gathered to date it is probable that a low number of bats are using the property and shed as a day roost and the roosts are considered to be of low conservation significance, and important at a site level only.
- 6.2 There is no evidence to indicate extended roosting (hibernation) or use by female bats as a maternity roost. The proposed changes will result in disturbance and destruction of a day roost for a low number of soprano pipistrelle bats (<3) and a moderate negative impact will result at site level only.
- 6.3 The cumulative evidence leads me to conclude that an EPSL is required and mitigation measures (against the risk of destruction and disturbance, killing or injuring bats during the work), and compensation/enhancement measures (to provide continued bat roosting provision at the site) must be implemented as a condition of the planning consent.

7. References

Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition).
Bat Workers Manual – Mitchell-Jones & McLeish 2004.
Bat Mitigation Guidelines – Natural England 2006.
The Conservation and Habitat Regulations – 2017.



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8. Queries

Any queries regarding this report should be addressed, in the first instance, to Urban Tree Experts:

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APPENDIX 1

Folio No: 1887-2024
Purchase Order: KH202404
Contact: Urban Tree Experts
Issue Date: 17.06.2024

Biological Report

Technical Report



SureScreen Scientifics

Biological Sample Analysis

Summary

Most biological materials (tissue, feces, hair, blood, etc.) contain small amounts of DNA from the organism of which it originated. Using molecular methods such as PCR (polymerase chain reaction) and DNA sequencing, SureScreen Scientifics are able to analyze an unknown sample to determine which species the sample originates from our methods are optimized for the detection of species including bats (over 92% of bat species worldwide can be identified including all 18 UK bat species), mammals; bees, wasps & hornets; birds; fish; plants (from roots, leaves, stem and even dried wood) and many more species.

Results

Lab ID	Site Name	OS Reference	Sample Type	Species Name	Match(%)
B3347	West Greylake		Bat Dropping	Common pipistrelle (Pipistrellus pipistrellus)	100.00
Genetic Sequence TTGGAACTGACTAGTTCCACTAATAATTGGAGCCCCTGACATGGCATTTCCTCGTATAAATAATATAAGTTTCTGA CTCCTACCTCCTTCTTTTCTACTACTACTAGCCTCGTCTATAGTAGAAGCGGGAGCGGGTACAGGCTGAACAGTCT ACCCCCCTCTAGCAGGAAACCTTGCTCATGCTAGGAGA					

Matters affecting result: none
Reported by: Lauryn Jewkes

Approved by: Christopher Troth

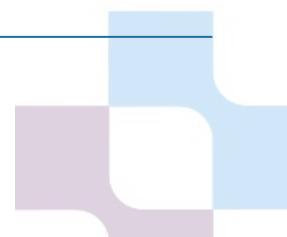


Methodology

Once samples have arrived in the laboratory, the DNA is isolated using a commercial DNA extraction kit. Using PCR, DNA (if present within the sample) is amplified using universal molecular markers designed to amplify a short fragment of the DNA of the target species group (i.e. mammal, fish, arthropod, reptile, plant etc.). If amplification is successful, the resulting DNA sequence is revealed using a process known as Sanger Sequencing in order to obtain the genetic sequence of the mitochondrial gene within the sample. The sequence results are aligned against a library of known reference sequences using bioinformatics software, which enables us to determine which species the DNA sequence from the sample matches with, informing the species identity and sequence similarity (match %). If the initial analysis is unsuccessful, the entire process is repeated up to two additional times with a fresh reserve sample (if available) in order to obtain a species identification. If no DNA is detected after three attempts, then we can be confident that any further analysis of the sample will likely also fail to result in species identification.

Interpretation of Results

Sample Type:	The sample you send to us can come from a variety of sources. Fecal, dropping, urine, hair, blood, carcass (skin, flesh, bone), gamete, plant matter or unknown biological material all contain DNA that we can test for in order to identify the species of origin.
Genetic Sequence:	The unique DNA sequence obtained from the sample.
Match (%):	How closely matched the DNA sequence from your sample is to the sequences within our reference database. This can be interpreted as a score of result accuracy, with the maximum score of 100% indicating an exact match of the sample to the indicated species' reference sequence. Lower scores (80-99%) indicate some variation between the sample and reference sequence, likely due to natural variation between individual genetic sequences and/or systematic variations generated through the sequencing process. Scores below 80% similarity should be interpreted with care and can indicate part degraded or part contaminated samples.
Inconclusive Result:	Degraded sample: DNA is degraded and we are unable to determine species identification due to degradation of sample DNA. This can happen either before sample collection (old samples, exposure to UV etc.) or after sample collection if stored for long periods before analysis or not handled correctly. Inhibited/contaminated sample: We are unable to determine species identity due to contamination or the suspected presence of large quantities of PCR inhibitors. Contamination sources can originate from other species which could have come into contact with the samples, or human contamination during sample collection.
Alternative Result:	Sometimes, for targets such as bat dropping analysis, other mammalian species such as rodents are detected. We find this to be a common occurrence as some bat droppings can be similar in appearance to rodent droppings. Although sometimes unexpected, repeat analyses in these cases would likely return the same results.





APPENDIX 2

West Greylake, Part Lane, Riseley, Reading, RG7 1RU
Example screenshots from night vision cameras

A



B



C

