



BAT ROOST ASSESSMENT

**103 Lonsdale Road
Oxford
OX2 7ET**

**Report
24th April 2023**

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Report reference:
C2962-3

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QUALITY ASSURANCE

Survey conducted by	Mike Sharp MCIEEM Principal Ecologist	Survey Date	06.05.2022 (PRA) 13.07.2022 (Dusk emergence) 03.08.2022 (Dusk emergence)
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Date	Version	Prepared by	Checked and approved by
18.08.22	Final	Mike Sharp MCIEEM Principal Ecologist	Catherine Coton ACIEEM Senior Ecologist
12.09.22	Amended	Mike Sharp MCIEEM Principal Ecologist	Catherine Coton ACIEEM Senior Ecologist
24.04.23	Plans amended and report updated	Mike Sharp MCIEEM Principal Ecologist	Catherine Coton ACIEEM Senior Ecologist

The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Every reasonable attempt has been made to comply with BS42020 (Biodiversity: Code of practice for planning and development); the CIEEM Guidelines for Ecological Report Writing (CIEEM, 2015) and the Bat Conservation Trust's Bat Surveys for Professional Ecologists: Good practice guidelines 3rd edition (Collins, 2016). If compliance has not been achieved, justification/explanation has been given.

Validity of report

The results of the bat survey are valid for a year from the date the final survey was carried out (August 2022). Should the works to the building be delayed beyond this date, this survey should be updated to determine any changes in the status of the site. Any licence application submitted to Natural England must be supported by bat survey data from the most recent active season (May to August/September inclusive). Therefore, updated bat surveys will be required if the licence application is delayed beyond April 2023.

The proposed development details provided by the client (see Section 4 of this report) were used to determine the assessment of effects. If the proposed development changes, the report will need to be reviewed to determine if there will be any changes to the assessment of effects and the overall outcome of the development.

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SUMMARY

- A preliminary bat roost assessment was undertaken in May 2022 of a dwelling and garage/outbuilding at 103 Lonsdale Road, Summertown, Oxford OX2 7ET. Two bat activity (roost characterisation) surveys were subsequently conducted in July and August 2022. The surveys and assessments were required in connection with proposals for a part two-storey rear extension and a single storey rear extension, in addition to a partial loft conversion and extension with dormers and a carport to the front of the garage. A bat loft secured through a previously consented scheme (22/00489/FUL) will be retained.
- The purpose of this report is to identify and describe the potential impacts of the works on bats and to identify additional survey work that may be required to support a protected species licence application, should this be necessary. Impacts on nesting birds are also considered. The report also provides information on the legislative requirements relating to bats and nesting birds.
- 103 Lonsdale Road, is located in a suburban edge location close to habitats of moderate suitability for foraging and commuting bats. The dwelling offers 'high' suitability for bat roosting and a suspected maternity roost of brown long-eared bats *Plecotus auritus* (11 individuals) was present in the loft at the time of preliminary survey. A single soprano pipistrelle *Pipistrellus pygmaeus* was also present roosting behind hanging tiles on the south-west corner of the dwelling. The garage/outbuilding is of 'negligible' suitability for roosting bats.
- The bat activity surveys confirmed the presence of the maternity roost of brown long-eared bats (peak count of 12) and day roosts for a individual common and soprano pipistrelles behind hanging tiles.
- Because 103 Lonsdale Road is a confirmed bat roost, and as the proposed works will impact on bats, **a protected species mitigation licence, issued by Natural England, will be required before the works can be undertaken.** The licence application can only be made once planning permission has been approved. A Bat Mitigation Strategy is provided in Appendix 3.
- The results of the survey are valid for a year from the date the final survey was carried out (August 2022). Should the works to the buildings be delayed beyond this date, this survey should be updated to determine any changes in the status of the site. Any licence application submitted to Natural England must be supported by bat survey data from the most recent active season (May to August/September inclusive). Therefore, updated bat surveys will be required if the licence application is delayed beyond April 2023.

1 INTRODUCTION

1.1 Background

A preliminary bat roost assessment was carried out of 103 Lonsdale Road, Summertown, Oxford OX2 7ET on 6th May 2022. Subsequently, two bat roost characterisation (activity) surveys were undertaken on 13th July and 3rd August 2022. The site is located at an approximate central OS grid reference of SP51150937.

The surveys and assessments were required in connection with proposals for *“Erection of a part single part two storey rear extension. Formation of 2no rear dormers and 1no side dormer in association with loft conversion. Insertion of 1no door, 1no rooflight and 3no windows to side elevation. Insertion of 1no rooflight to rear elevation and 1no window to front elevation. Formation of a car port to front elevation of the existing garage”*

Oxford City Council requested a bat survey to support the planning application (Ref: 22/00489/FUL).

1.2 Personnel

The preliminary roost assessment and reporting were carried out by Mike Sharp who is employed as Principal Ecologist by Swift Ecology Ltd (SEL) and is an experienced bat surveyor and holder of a Natural England survey licence for bats (Class Licence reference WML-CL18 ref 2015-11209-CLS-CLS), barn owl (Class Licence reference CL29/00270) and great crested newts (Class Licence reference WML-CL08), and a Registered Consultant under the Bat Mitigation Class Licence (RC009). Mike is also Accredited at Level 3 under the Bat Earned Recognition Licence (WML-CL47). Mike graduated in 2004 from the University of Plymouth and has over 15 years' experience in the ecological sector, working both as a consultant ecologist and as a local authority ecologist in this time. Mike has undertaken numerous preliminary ecological assessments (FISC Level 3), preliminary roost assessments (bats) and surveys for protected species including great crested newt, reptiles and dormouse; and prepared subsequent reports with appropriate recommendations. He is the named ecologist on over 30 protected species mitigation licence applications and is qualified in tree climbing and aerial rescue techniques.

The bat activity surveys were undertaken by Dr Merryl Gelling of Spires Ecology Ltd, on behalf of SEL. Merryl holds Natural England Bat Survey Licences WML CL19 and 20 (Levels 3 & 4; numbers 2015-13150-CLS-CLS & 2015-13151-CLS-CLS), permitting disturbance of bats for the purposes of surveying for science and education or conservation, and WML CL21 (Registered Consultant RC083), permitting the registration of individual sites under the Bat Mitigation Class Licence. Assistance on the activity surveys was provided by Dr Amanda Lloyd MCIEEM, who also holds a level 2 Natural England Bat Survey Licence (WML CL18 2016-23252-CLS-CLS) and Mr Karl Lofthouse (WML CL18-2015-15163-CLS-CLS).

1.3 Site Context

103 Lonsdale Road is located in a suburban setting in the north of Oxford. The site comprises a detached two-storey dwelling and single storey garage/outbuilding with mature gardens. To the west and north of the site are areas of medium density housing with well vegetated gardens. To the south are the grounds of the Cherwell School, comprising mainly amenity grassland and sports pitches divided by mature lines of trees, hedgerows and small copses. To the east of the site is the riparian corridor of the River Cherwell (within approximately 150 m) and pasture fields bounded by outgrown hedgerows.

The site location and surrounding landscape are illustrated in Figures 1.1 and 1.2.



Figure 1.1: Landscape context and location of 103 Lonsdale Road (red outline).

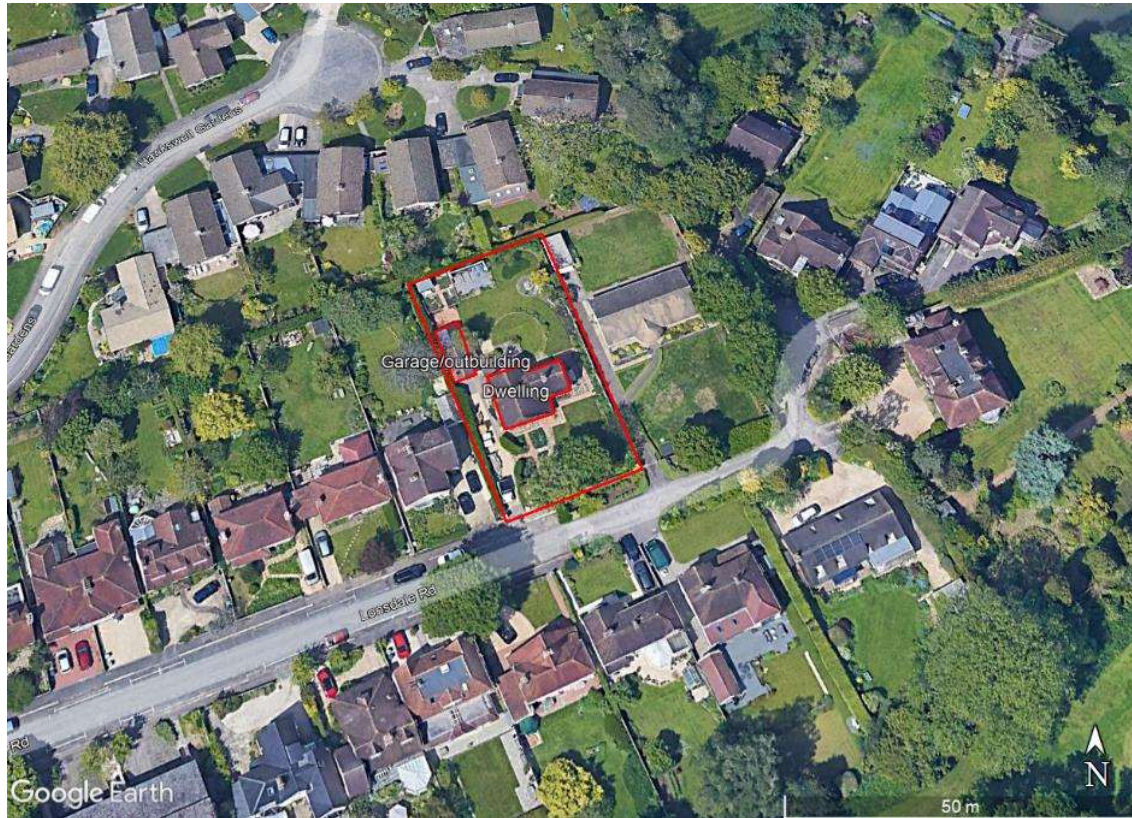


Figure 1.2: Aerial photo of 103 Lonsdale Road and immediate surrounds

1.4 Purpose of Report

The purpose of this report is to identify and describe all potentially significant ecological effects upon bats or bat roosts in the existing building, and to set out the mitigation, enhancement and compensation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects. In addition, impacts on other protected species are considered.

The legal protection and planning policies relevant to the species mentioned in this report are detailed in Appendix 1.

2 METHODS

2.1 Background Data Search

A background data search was undertaken in May 2022 for bat records within 2 km of the site from the Thames Valley Environmental Records Centre (TVERC).

Reference was also made to Natural England's MAGIC website¹ for records of granted Natural England bat licences within a 2 km radius.

2.2 Preliminary Bat Roost Assessment

The preliminary bat roost assessment was undertaken on 6th May 2022 by Mike Sharp of Swift Ecology Ltd.

Weather conditions at the time of the survey are shown in Table 2.1. The survey covered the dwelling and garage/outbuilding as shown in Figure 1.2, Section 1. Adjacent habitats were briefly assessed for their value for bats, as shown in Figures 1.1 and 1.2, Section 1.

Table 2.1: Survey conditions

Date	Approximate start time	Weather conditions
06/05/22	14:00	18.5°C, bright and sunny (60 % cloud cover) with a light breeze (Beaufort F1).

2.2.1 Assessment of Bat Roost Potential

The buildings were assessed for their potential to support bat roosts. This involves a consideration of various factors including:

- Light levels
- Temperature regime and protection from weather
- Access to the interior of the buildings or to other suitable roost sites
- Potential roost sites
- Building construction
- Habitat context

Based on these factors, an assessment was made of whether the buildings might support bats, and the type and number of roosts that might be present. The buildings were assigned a roost potential category (Collins, 2016) according to the criteria outlined in Table 2.2 below, based on the results of the assessment.

Roost type descriptions are provided in Appendix 2.

¹ <https://magic.defra.gov.uk/MagicMap.aspx>

Table 2.2: Guidelines for assessing the potential suitability of buildings/structures for roosting bats (based on Collins, 2016).

Category	Category description
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A building or structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	A building or structure 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).
High	A building or structure with one or more potential roost sites 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.
Known roost	Building or structure currently supporting bats (based on presence of bats, or evidence of use such as droppings, carcasses etc.)

2.2.2 Survey for Signs of Bats

A detailed inspection was made of the exterior and interior of the buildings for any evidence of bat use, such as live or dead bats, droppings, scratch marks, staining and prey remains (e.g. moth or butterfly wings), and in some cases the absence of cobwebs. Large quantities of cobwebs in roof voids or at access points tend to be suggestive of no bat use, although this evidence is not conclusive.

Features identified as possible bat access points or potential roosting locations were thoroughly searched where possible, using powerful torches and binoculars to facilitate the process. Ladders were available to enable more detailed inspection of cracks and crevices as far as safe access allowed.

2.3 Bat Roost Characterisation Surveys

Prior to the dusk emergence surveys a brief inspection of the loft was undertaken by Dr Merryl Gelling.

Two roost characterisation bat activity surveys were carried out on 13th July 2022 (dusk emergence) and 3rd August 2022 (dusk emergence). The activity surveys were undertaken by Dr Merryl Gelling with assistance from Dr Amanda Lloyd and Mr Karl Lofthouse.

Emergence activity surveys (dusk surveys) were conducted by three surveyors observing the outside of the building, each equipped with heterodyne and frequency division bat detectors (BatLogger M, Echo Meter 3, Anabat Walkabout, EMT2 Pro). Up to three thermal cameras were also used: Pulsar Helion XP50, Flir Scion PMT166, and a Guide TrackIR Pro19. Surveyors were in position at least 15 minutes before dusk and remained for up to two hours after dusk. Sound analysis was conducted with BatExplorer and Kaleidoscope.

The bat activity survey approach was based upon Collins, 2016. Details of timings and weather conditions are given in Table 2.3.

Table 2.3: Bat Activity Survey Details

Survey type	Dusk emergence survey	Dusk emergence survey
Date	13/07/22	03/08/22
Weather conditions	Warm evening with little breeze.	Warm evening, with light breeze
Start temperature (°C)	21	21
End temperature (°C)	19	18
Wind (Beaufort)	1	2
Precipitation	Nil	Nil
Sunrise/Sunset	2119	2050
Start time	2104	2035
End time	2251	2220
Surveyors	Dr Merryl Gelling Dr Amanda Lloyd Mr Karl Lofthouse	Dr Merryl Gelling Dr Amanda Lloyd Mr Karl Lofthouse

2.3 Limitations

No recent sweeping or other cleaning had been undertaken of the building.

An initial assessment and bat inspection surveys cannot rule out bat presence from inaccessible areas, as bats may roost in areas that are not accessible other than by a destructive search, such as within wall cavities, under ridge tiles or between roof tiles and timbers.

The activity surveys were carried out in good weather conditions and there were no significant constraints.

BCT guidance (Collins, 2016) recommends for confirmed roosts that sufficient survey effort should be undertaken to inform impact assessment and the design of mitigation, and that this is very much site-specific. In this case, the building is a relatively simple structure and the consistency of results between the preliminary assessment and two bat activity surveys (both undertaken using night vision equipment) gives sufficient confidence that no further surveys are necessary.

3 RESULTS

3.1 Background Data Search

TVERC provided 168 records of bats within a 2 km radius of the site, recorded between 1995 and 2018. At least ten species have been recorded, namely common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, Nathusius' pipistrelle *P. nathusii*, noctule *Nyctalus noctula*, Leisler's bat *N. leisleri*, serotine *Eptesicus serotinus*, Bechstein's bat *Myotis bechsteinii*, Daubenton's bat *M. daubentonii*, an indeterminate *Myotis* species, brown long-eared bat *Plecotus auritus* and barbastelle *Barbastella barbastellus*. The majority of records are aural bat detector records (including that of Bechstein's and barbastelle) from the Wolvercote Tunnel and Oxford Northern Gateway development. The nearest confirmed roost records are from a location approximately 2 km south, comprising a large soprano pipistrelle maternity roost.

Reference to Natural England's Magic website, which holds records of granted bat mitigation licences issued by Natural England since 2009, identified six bat licences within 2 km of the site. Details are provided in Table 3.1. below.

Table 3.1: Details of granted EPS licences within 2 km of 103 Lonsdale Road

Licence Reference	Bat species	Permitted activities
EPSM2012-4539	Common pipistrelle	Destruction of resting place
2014-2499-EPS-MIT	Common pipistrelle	Destruction of resting place
2015-15232-EPS-MIT	Soprano pipistrelle	Destruction of resting place
2014-3653-EPS-MIT	Common pipistrelle, Soprano pipistrelle, Brown Long-eared bat, Daubenton's bat and Natterer's bat	Damage and Destruction of resting places
2016-22076-EPS-MIT	Common pipistrelle	Destruction of resting place
2018-38241-EPS-MIT	Soprano pipistrelle	Destruction of breeding site

An absence of records does not mean that a particular species is not present, merely that it has not been recorded. Many species records are not obtainable from the sources utilised and there may be further undetected records for such species on the study site or in the local area.

3.2 Assessment of Habitats

The habitats around 103 Lonsdale Road comprise suburban dwellings with mature gardens, which are well connected to lines of mature trees and small woodland copses to the south and the riparian corridor of the River Cherwell to the east.

Habitats within the surrounding landscape (100 m to 2 km and beyond) are of 'moderate' suitability for foraging and commuting bats. The A40 runs from east to west approximately 700 m north of the site, and illuminated sections of this road could provide a barrier to bat movements to the north. Similarly the B4495 runs from east to west approximately 700 m south of the site and could also form a potential barrier to bat movements. To the west, the built-up area of Summertown in north Oxford, especially along the A4165 Banbury Road, is likely to form a barrier to bat movements due to the high levels of street-lighting.



Photo 1: South elevations



Photo 2: South and east elevations



Photo 3: North elevations



Photo 4: South elevations of garage/outbuilding

3.3 Building Descriptions

Plans illustrating the building surveyed are provided in Figure 3.1.

Dwelling

103 Lonsdale Road was built in 1925 and comprises a two-storey, detached brick dwelling in the arts and crafts style (Photos 1-3). The building is roughly 'T-shaped' with a pitched roof clad in plain concrete tiles, with the east-west ridge line subservient to the principal north-south ridge line. There are two chimney breasts, each located roughly centrally on the east-west and north-south ridges. The upper elevations are clad in plain clay hanging tiles on all sides, with ground-floor walls either rendered and painted white or with plain brick facing.

Internally, the ground and first floors are used as living space with loft areas above. The inter-connected loft areas are T-shaped with a principal north-south loft (with a ridge height of approximately 2.5 m) and with a subservient east wing (with a ridge height of 1.9 m). The loft is lined with black bitumen felt over mesh wire and ventilated at each gable through an arrow slit vent (boarded over internally on the north gable). The north end of the principal north-south loft area is used for occasional storage.



Photo 5: North end of principal loft with ventilation slit in gable wall boarded over internally



Photo 6: East end of subservient east-west loft with ventilation slit in gable wall



Photo 7: South end of principal loft with metal grille over ventilation slot



Photo 8: Looking towards east end of subservient east-west loft with chimney breast in foreground

Garage/outbuilding

The garage/outbuilding is constructed of brick with various roof sections clad in plain clay tiles, profiled metal sheets and wooden shingles (Photos 4 & 9). The south end of the building comprises a garage area, which has rooflights and a small mezzanine loft and is used for storage. The north end of the garage/outbuilding comprises a small 'home office'.



Photo 9: North and east elevations of garage/outbuilding



Photo 10: Internal 'loft' area of garage (south end)



Photo 11: Internal area of garage (south end)

3.4 Assessment of Bat Roost Potential and Survey for Signs of Bats

3.4.1 Bat Roost Potential

Dwelling

103 Lonsdale Road is generally in good condition. The roof tiles are generally close-fitting, although there are a few gaps under roof and ridge tiles which may provide bat access to the 'batten' space between tiles and the lining, or to the loft void (via any gaps in the lining). Gaps in the mortar under ridge tiles may also provide access to cavities under ridge tiles themselves (e.g. Photo 12). There is lead-flashing around the bases of the chimney breasts where gaps may enable bat access to the loft or provide suitable locations for crevice-roosting species such as pipistrelle bats. Gaps at the eaves also provide potential access to the loft or to potential roost locations at the wall tops.

The hanging tiles are also in good condition with few lifted tiles noted. However, the corner tiles (on all elevations) have gaps which provide bat access to the 'batten space' behind (Photo 13). There were also some gaps between hanging tiles noted on the west elevation around the bay window roof (Photo 14) and where climbing plants have previously forced tiles apart.

Internally, the interconnected loft void provides dark, sheltered and thermally stable conditions suitable for summer roosting by species which favour open voids for roosting (e.g. long-eared bats).



Photo 12: Missing mortar/gaps under ridge tiles on rear single-storey extension



Photo 13: Gaps between 'corner' hanging tiles (all elevations)



Photo 14: West elevation – gaps at eaves, under hanging tiles around bay window and where tiles forced apart by climbing vegetation (in the past)

Potential roost locations include:

- Internal loft areas;
- Gaps behind hanging tiles;
- Crevices under roof and ridge tiles;
- Crevices under lead-flashing around chimneys; and
- Crevices at wall tops.

Given the range of potential roost locations present, the building is likely to provide highly suitable conditions for roosting bats over summer months (potentially including maternity roosts) as well as at other times of year, including winter roosting.

The building is assessed as being of 'high' suitability for roosting bats.

Garage/outbuilding

The garage/outbuilding is in good condition and generally well-sealed, with no obvious suitable roosting crevices noted. Internal areas are well-sealed and generally light and/or not accessible to bats.

The garage/outbuilding is assessed as being of 'negligible' suitability for roosting bats.

3.4.2 Evidence of bats

The locations of evidence of bats found during the survey, and the relevant target notes are shown in Figure 3.1.

Scattered bat droppings of medium size and varying ages were found scattered throughout the loft with significant accumulations of fresh droppings under the ridge at the south end of the principal loft area (Target Note 1). A cluster of 10 brown long-eared bats and one single brown long-eared bat were present roosting against the ridge board at this location (Photos 15 and 16). A number of droppings were adhered to the upper areas of the chimney breast (above which daylight was visible), indicating the potential for gaps around the chimney breast to be used as an access point (Target Note 2).

A second, smaller accumulation of bat droppings was present under the ridge of the subservient east-west loft area (Target Note 3). No bats were visible in this area. The ventilation slot in the east gable also provides a potential access point into the loft.

A single soprano pipistrelle was present behind a hanging tile on the south-west corner of the dwelling (Target Note 4, Photo 18) and a number of fresh droppings were present behind adjacent tiles (both above and below).



Photo 15: Cluster of 10 brown long-eared bats against ridge board (TN1)



Photo 16: Single brown long-eared bat against ridge board (TN2)



Photo 17: Chimney breast with bat droppings indicating potential access point (TN3)



Photo 18: Single soprano pipistrelle behind hanging tiles (TN4)

3.5 Nesting Birds

No evidence of nesting birds was noted, but gaps at the eaves could potentially provide suitable opportunities for species such as house sparrow *Passer domesticus*.

3.6 Bat Roost Characterisation Surveys

3.6.1 Dusk emergence survey 13th July 2022

Prior to the activity survey Dr Merryl Gelling surveyed the loft void. Approximately eight adults and one juvenile brown long-eared bat were observed within the void at three locations. Bat droppings were seen throughout the loft (Roost 3). See Figure 3.2, TN1 = three brown long-eared bats and one juvenile, TN2 = four brown long-eared bats, TN3 = two brown long-eared bats.

The earliest bat activity was seen at 21:23; a commuting noctule. Soprano and common pipistrelle bats were heard foraging within the front and rear gardens.

In total nine bats emerged from 103 Lonsdale Road as follows:

- 21:31 – Soprano pipistrelle emerged from behind a hanging tile on the north gable.
- 21:47 -22:33 – Eight brown long-eared bats emerged from the ventilation slit on the south gable.

The results of the survey are illustrated in Figure 3.2.

3.6.2 Dusk emergence survey 3rd August 2022

The earliest bat activity was seen at 21:05; a commuting soprano pipistrelle bat. Soprano and common pipistrelle bats were heard foraging within the front and rear gardens.


In total 14 bats emerged as follows:

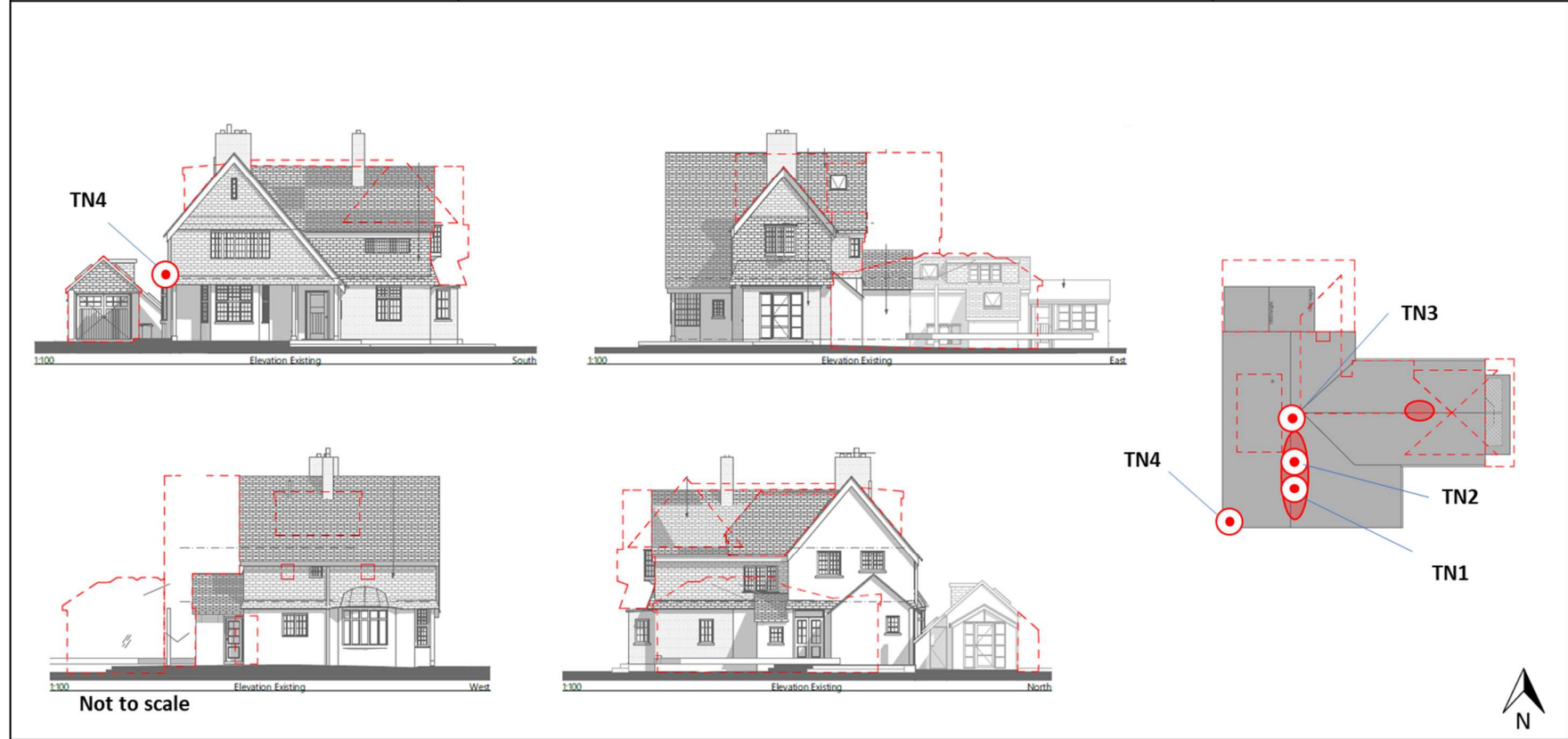
- 21:13 – Common pipistrelle emerged from behind a hanging tile on the south-west corner of the house.
- 21:20 -21:43 – Twelve brown long-eared bats emerged from the ventilation slit on the south gable.
- 21:21 – An indeterminate bat species (not echolocating) appeared to emerge from the roof valley facing south-east. The bat was observed by two surveyors, but the precise point of emergence was not confirmed (possibly BLE emergence from around base of chimney).

The results of the survey are illustrated in Figure 3.3.



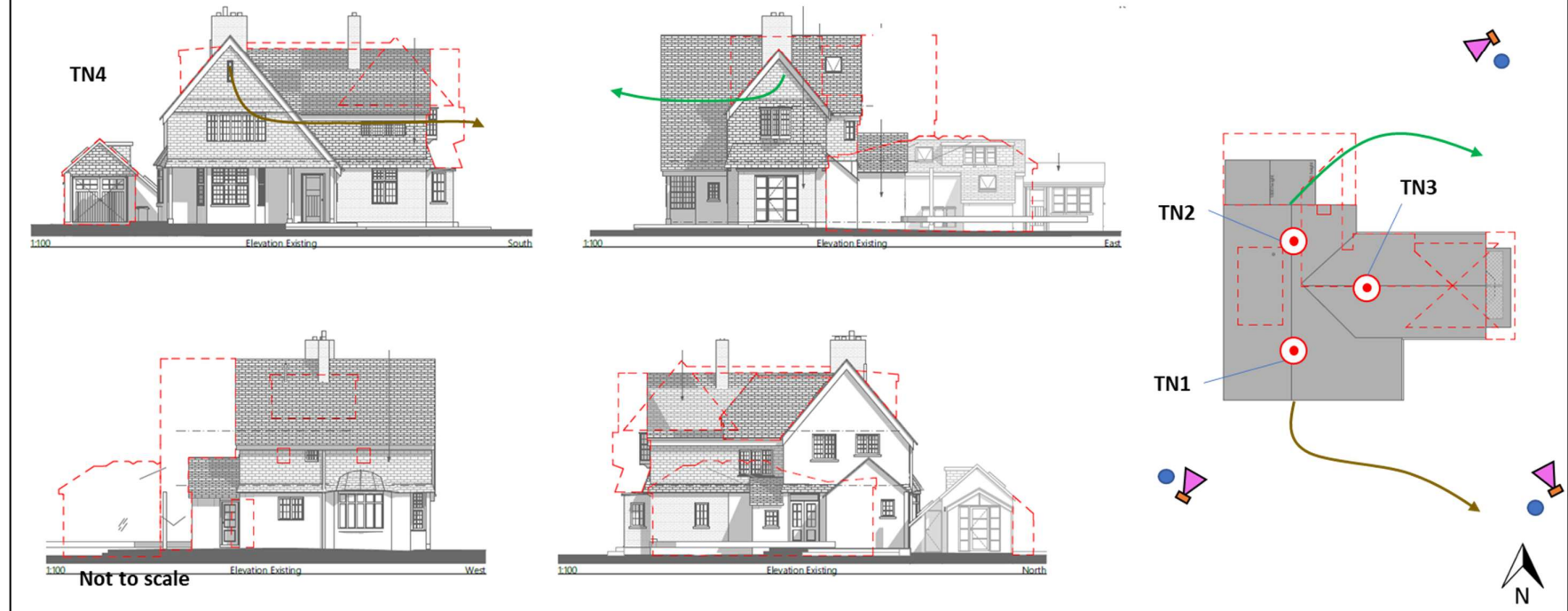
Photo 19: Flir snapshot of brown long-eared bat access point in green (ventilation slit), common pipistrelle roost (red circle) and approximate location of indeterminate bat species observation (orange circle).


<p>C2962 103 Lonsdale Road, Oxford Preliminary Bat Roost Assessment May 2022 Figure 3.1</p>	<p>KEY</p> <p>----- Proposed alterations</p> <p>○ Target Note</p> <p>● Accumulations of bat droppings</p>	
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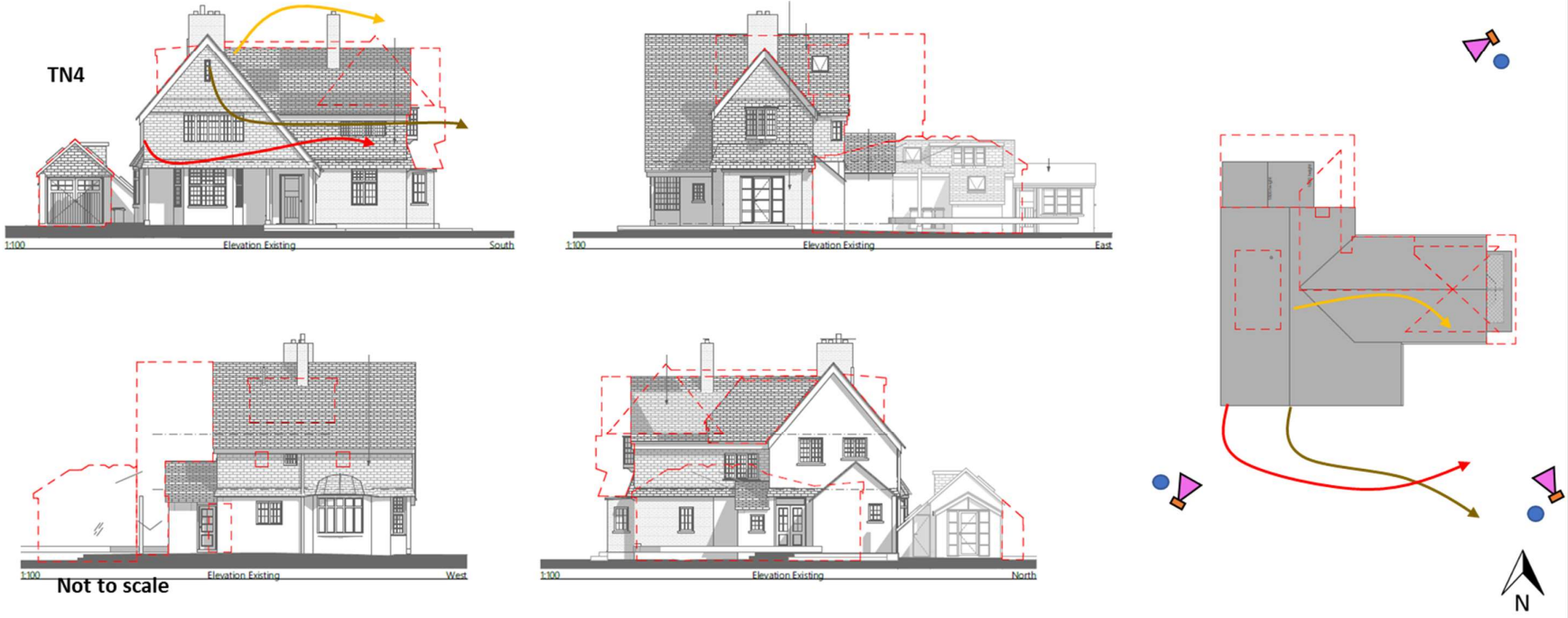
<p>C2962 103 Lonsdale Road, Oxford Bat Activity (Roost Characterisation) Survey 13th July 2022 Figure 3.2</p>	<p>KEY</p> <ul style="list-style-type: none"> - - - Proposed alterations ● Target Note ● Surveyor Location ▲ Thermal Camera Location → Bat emerging (solid line) → Soprano pipistrelle → Brown long-eared bat 	
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21:31 – Soprano pipistrelle emerged from behind a hanging tile on the north gable
 21:47 - 22:33 – Eight brown long-eared bats emerged from the ventilation slit on the south gable



<p>C2962 103 Lonsdale Road, Oxford Bat Activity (Roost Characterisation) Survey 3rd August 2022 Figure 3.3</p>	<p>KEY</p> <ul style="list-style-type: none"> - - - - Proposed alterations ● Surveyor Location ▲ Thermal Camera Location → Bat emerging (solid line) → Common pipistrelle → Brown long-eared bat → Indeterminate bat species 	
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21:13 – Common pipistrelle emerged from behind a hanging tile on the south-west corner of the house.
 21:20 -21:43 – Twelve brown long-eared bats emerged from the ventilation slit on the south gable
 21:21 – An indeterminate bat species (not echolocating) appeared to emerge from the roof valley facing south-east. The bat was observed by two surveyors, but the precise point of emergence was not confirmed (possibly BLE emergence from around base of chimney).



4 EVALUATION AND IMPACT ASSESSMENT

4.1 Proposed development

The proposals are for a part two-storey rear extension and a single storey rear extension, in addition to a partial loft conversion and extension with dormers and a carport to the front of the garage. The bat loft (located over bedroom 1) will be retained as per the previously consented scheme (22/00489/FUL).



Figure 4.1: Proposed plans (extract taken from Space Program drawing A.03.4 REV H)

4.2 Bats

4.2.1 Habitats

There are bat records within the local area. The habitats within the surrounding landscape offer moderate quality foraging opportunities for bats and also provide features along which bats may commute to other habitats in the wider area.

The proposals will not result in the loss of any foraging or commuting habitat or loss of flight lines from confirmed or potential roost sites.

Currently, there is some limited artificial lighting of 103 Lonsdale Road (i.e. street lighting). The proposed new extensions/loft conversion will not require new external lighting and no new artificial lighting of adjacent habitats will be necessary.

4.2.2 Roosts

The dwelling at 103 Lonsdale Road is assessed as being of 'high' suitability for roosting bats and is a confirmed bat roost. The following bat roosts are present:

- Loft - brown long-eared bat maternity roost (peak count 12 bats)
- Hanging tiles: north gable - soprano pipistrelle (day roost for individual bat).
- Hanging tiles: south gable/west corner - common pipistrelle and soprano pipistrelle (day roost for individual bat).

The building is suitable for use by bats on a regular basis and potentially for long periods of time, year round, due to the number of potential and confirmed roost features, their size, the shelter and protection they afford, the range of environmental conditions present and due to the relatively high quality of the surrounding habitats for bats.

The dwelling has some limited suitability for use as a hibernation roost for individual/low numbers of vespertilionid bat species (e.g. *Pipistrellus* or *Plecotus* species).

The garage/outbuilding is of negligible suitability for roosting bats.

Status of the species present

Common and soprano pipistrelle are common and widespread in Oxfordshire and the UK. The numbers of common and soprano pipistrelle recorded as roosting at 103 Lonsdale Road indicate that no maternity colonies of this species are involved; according to English Nature's Bat Mitigation Guidelines (Mitchell-Jones, 2004), the conservation significance of the common and soprano pipistrelle roosts in the building, involving small numbers of two common species with no maternity colony present is 'low'.

Brown long-eared bat is common and widespread in Oxfordshire and the UK. The numbers of brown long-eared bats recorded as roosting at 103 Lonsdale Road confirm that a maternity colony of this species is present; according to English Nature's Bat Mitigation Guidelines (Mitchell-Jones, 2004), the conservation significance of the brown long-eared bat roosts in the building, involving a small maternity colony is 'moderate'.

4.2.3 Impact assessment

On the evidence provided by this survey, the proposed extensions and loft conversion will have an impact upon bats and their roosts and, therefore, offences will occur. In order to avoid offences **a protected species mitigation licence will be required from Natural England before works can commence.** Natural England will require up-to-date survey information to inform the licence application.

The proposed works (in the absence of mitigation) could result in the following adverse impacts upon bats:

- Disturbance to bats while works are going on, including increased noise, dust and vibration, and changes to the lighting and temperature regime in and around roosts;
- Interference with, obstruction of and loss of access points;
- Possible harm to bats that may be roosting within or under materials to be removed (e.g. roof tiles, hanging tiles, lead-flashing);
- Temporary or permanent modification of existing voids or structures so that they are no longer suitable for use by roosting bats, for example through re-roofing, loft conversion works and insulation; and
- Destruction of bat roosts.

Given the status of the roosts present, the unmitigated impacts of the proposed works (with the loss of a small maternity roost of a common bat species and day roosts for low numbers of two common bat species are 'moderate'; according to English Nature's Bat Mitigation Guidelines (Mitchell-Jones, 2004).

Because the presence of bat roosts has been confirmed, a bat mitigation plan will be required to ensure that the favourable conservation status of the bats at the site can be maintained during and after works.

4.3 Nesting Birds

The building has the potential to support nesting birds and the extension and loft conversion could potentially result in the loss of nesting bird habitat. In the absence of mitigation, the potential adverse impacts on nesting birds of the proposed works are as follows:

- Disturbance to nesting birds while works are going on, including increased noise, dust and vibration;
- Loss of nest sites; and
- Possible harm to birds.

All species of bird are protected under current legislation whilst nesting.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 *Protected Species Licence Application*

In order to avoid offences, a protected species mitigation licence will be required from Natural England before works that would affect the bat roosts present can commence. Because there is a maternity roost present, the site IS NOT eligible to be registered under the Bat Mitigation Class Licence (BMCL) based on the current survey data and a full protected species licence application (see A below) or registration under the Bat Earned Recognition Class Licence² (WML-CL47) (see B below) will be required.

The Bat Earned Recognition Licence is a pilot licensing process being run by Natural England with the aim of improving the delivery of licences for development purposes. Mike Sharp is accredited at Level 3 under the BER, which covers the majority of roost types and species in the UK. The site is eligible for registration under the BER based on current information.

Works conducted under the licence will be guided by the Bat Method Statement (Appendix 3), which provides details of measures to avoid disturbance or harm to bats during works, measures to compensate for lost roosting habitat, and post-works monitoring.

A. *Protected Species Mitigation Licence Application*

The application for a protected species mitigation licence is in three parts:

1. the application form, to be signed by the ecologist and developer;
2. a Method Statement, which provides survey results, an interpretation, and a detailed mitigation strategy, including plans; the mitigation strategy will provide details of measures to avoid disturbance or harm to bats during works (including timing constraints: works affecting bat roosts may be restricted to the 'safe periods' when bats are least likely to be present (depending on roost type) measures to compensate for lost roosting habitat, and post-works monitoring;
3. a Reasoned Statement, which deals with planning issues, and which must be completed by the developer or his/her planning consultant or architect (in certain instances the completion of a Reasoned Statement is not necessary).

Full Protected species mitigation licences are issued by Natural England (NE), in consultation with the relevant local authority (if appropriate). Following their acknowledgement of receipt, NE staff require a minimum of 30 working days (typically 30-45 days) to consider a licence application. Licences usually cannot be applied for until any relevant permissions/consents have been granted (if required) and any conditions relating to wildlife have been discharged (that are capable of being discharged).

B. *Bat Earned Recognition Licence*

The application for a protected species mitigation licence under the Bat Earned Recognition (BER) Licence (WML-CL47) involves completion of an online site registration form. Given the

² The Bat Earned Recognition Licence is a pilot licensing project being run by Natural England. The pilot will run to the end of December 2022. Beyond that date it cannot be guaranteed this licensing route will be available for use and a full protected species licence may be required.

presence of a maternity roost of a 'Group 1' species of bat, the site would be registered under Annex C of the BER. This requires the named ecologist on the licence to be registered at Accreditation Level 2 (or higher). For AL2 registrations, the following documents must be submitted as part of the site registration request:

1. Declaration form (to be signed by the applicant);
2. Survey maps;
3. Impacts map; and
4. Compensation map.

As the proposals are 'small-scale', no detailed information is required to justify the need for the works.

BER licence site registrations are issued by Natural England. Registration to use the BER licence cannot take place until planning permission has been granted (if required) and any conditions relating to wildlife have been discharged. Following their acknowledgement of receipt, NE staff require 10-15 working days to consider a BER licence registration request.

Up-to-date activity surveys will be required in the bat active season (May to August) prior to the licence application being made. If the licence application is not submitted before the end of April 2023, top-up activity surveys will be needed.

5.2 Lighting

If lighting becomes necessary in future, a lighting designer must be consulted to detail the final lighting design and layout, implementing the following principles (please refer to '*Bats and artificial lighting in the UK; Guidance Note 08/18*' (Miles *et al.*, 2018) and '*Guidance Note 9/19 Domestic exterior lighting: getting it right!*' (Institute of Lighting Professionals, 2019) for further information):

- Any new lighting (internal and external) should be sensitively designed and sited so as to avoid an increase in the illumination of the site.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700 Kelvin, but 3000 Kelvin as a maximum) should be adopted to reduce blue light component.
- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
- Luminaires should feature peak wavelengths higher than 550 nm to avoid the component of light most disturbing to bats.
- Any external security lighting should be set on motion-sensors and short (<1 min) timers.
- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.
- The planting of trees, bushes and hedges could potentially be used to mitigate for impacts of artificial lighting through the creation of dark buffers, although the lack of space at this site may restrict such options.

5.3 Mitigation

In order to accommodate the species of roosting bat present, to ensure that bats are not harmed during works and to ensure that there are no negative effects on bat populations, detailed mitigation and compensation measures for bats have been designed into the scheme and will be incorporated into a working method statement (provided in Appendix 3).

5.4 Nesting Birds

No significant impacts are likely as no bird nests were identified within the peak period for nesting and no evidence of old nests was observed. However, commencement of works should be timed to avoid the nesting period (March to August) where possible. Where this is not possible pre-commencement nesting bird checks will be required. If nesting birds are present and works cannot proceed without disturbing them, then works must be halted until all chicks have fledged and left the nest.

5.5 Enhancements

The Environment Act (2021), Natural Environment White Paper (2011) and National Planning Policy Framework (2021) require that development results in net gains for biodiversity, with the Environment Act requiring a minimum of a 10% net gain in biodiversity value of the site post-development. Mandatory biodiversity net gain (as set out in the Environment Act 2021) will only be implemented fully through amendment of the Town & Country Planning Act and is likely to become law in 2023. Therefore current biodiversity net gain requirements may vary according to local planning policy.

Bird boxes could be integrated into the walls of new extensions to provide enhancements for biodiversity.

Bird nest/roost boxes

Boxes must be installed according to manufacturer's instructions out of direct sunlight, ideally facing north or east.

House sparrow terraces could be integrated into the northern wall of the new extension:

- **Habibat house sparrow terraces (or suitable alternative).** Boxes with three nest chambers could be installed under the eaves on a northerly elevation. These designs each provide nesting opportunities up to three pairs, which is important for this species which nests in colonies.



Figure 5.1: Habitat terraced sparrow box – can be faced to match finish.

5.6 Validity of Report

The results of this assessment are valid for a maximum of one year from the date the last survey was carried out (August 2022). Natural England will require up-to-date bat survey data from the current or most recent active period for bats (May to August/September) to inform a licence application.

6 RELEVANT LITERATURE

British Standard (2013). *BS 42020:2013: Biodiversity. Code of practice for planning and development.*

Chartered Institute of Ecology and Environmental Management (2017). *Guidelines for Ecological Report Writing.* CIEEM, Winchester.

Collins, J. (ed). (2016). *Bat Surveys for Professional Ecologists– Good Practice Guidelines, 3rd edition.* Bat Conservation Trust, London.

Institute of Lighting Professionals (2019). *Guidance Note 9/19 Domestic exterior lighting: getting it right!* ILP, Rugby. Available at: <https://theilp.org.uk/publication/guidance-note-9-domestic-exterior-lighting-getting-it-right/>. [Accessed 11/11/2021].

Lintott, P and Mathews, F. (2018). *Reviewing the evidence on mitigation strategies for bats in buildings informing best-practice for policy makers and practitioners.* Chartered Institute of Ecology and Environmental Management.

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Ministry of Housing, Communities and Local Government (2021). National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

Mitchell-Jones, A. J. (2004). *Bat Mitigation Guidelines.* Natural England, Peterborough.

APPENDIX 1 – LEGISLATION AND PLANNING POLICY

A1.1 Introduction

This section briefly lists legal protection/planning policy applying to designated sites, species or habitats mentioned in this report. It does not comprehensively reflect the text of the legislation/policy and it should not be relied upon in place of it. The following documents are relevant:

- The Local Government Act 1985;
- The Wildlife and Countryside Act 1981 (as amended);
- The Environmental Protection Act 1990;
- The Countryside and Rights of Way (CROW) Act 2000 (in England and Wales);
- The Natural Environment and Rural Communities (NERC) Act 2006;
- The Conservation of Habitats and Species Regulations 2017, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;
- Environment Act 2021;
- The Natural Environment White Paper (England) (DEFRA, 2011);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011), which underpins the UK Post-2010 Biodiversity Framework (JNCC & DEFRA, 2012);
- National Planning Policy Framework (MHCLG, 2021); and
- Oxford Local Plan 2036 (Adopted 2019).

A1.2 Protected Species

A1.2.1 All species of British bat

All species of British bat (*Vespertilionidae* and *Rhinolophidae*) are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and receive some limited protection under Section 9. These species are also all listed as protected species in Schedule 2 of The Conservation of Habitats and Species Regulations 2017, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which gives them full protection under Regulation 43.

It is also an offence to set and use articles capable of catching, injuring or killing such species (for example a trap or poison), or knowingly cause or permit such an action.

Where it is necessary to carry out an action that could result in an offence relating to a species protected under The Conservation of Habitats and Species Regulations 2017 (as amended), it is possible to apply for a licence from Natural England. Licences are only issued where Natural England is satisfied that the relevant legal tests have been met including that works are unavoidable and that reasonable steps have been taken to ensure that adverse effects on protected species are minimised.

Seven species of British bat are listed as species of principal importance for the purpose of conserving biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

A1.2.2 Birds

All species of bird are protected under Section 1 (1) of the Wildlife and Countryside Act 1981 (as amended). Certain species are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and receive protection under Section 1(5). There are special penalties where offences are committed for any Schedule 1 species.

Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 includes 49 bird species which are of principal importance for the purpose of conserving biodiversity in England.

APPENDIX 2 – BAT ROOST STATUS

Table A2.1. Details of bat roost types as per Collins (2016) and Natural England licence application documents.

Roost type	Description
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 it 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.
Maternity Roost	Where female bats give birth and raise their young to independence.
Hibernation Roost	Where bats may be found individually or together during winter they have a constant cool temperature and high humidity.
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.

APPENDIX 3 – BAT MITIGATION PLAN

A3.1 Introduction

Bat roosts are present in the dwelling at 103 Lonsdale Road. **No works to the dwelling (to the roof/loft or hanging tiles) can be undertaken until a protected species mitigation licence has been obtained from Natural England.**

A full protected species licence application will be made to Natural England **OR** (if available for use at the time of planning approval) the site will be registered under the Bat Earned Recognition Licence (WML-CL47) at Accreditation Level 2 (AL2). An AL2 application is required due to the presence of a maternity roost of a Group 1 species of bat (brown long-eared bat) which falls within Annex C.

In order to ensure that bats are not harmed during the proposed works, and that there are no adverse effects on bat roosts or on wider bat populations, the mitigation strategy contains the following elements:

- Toolbox talks to site workers;
- Provision of bat boxes;
- Timing – commencement of works to avoid the maternity period (May to September inclusive) and hibernation period (mid-November to mid March, inclusive);
- Pre-works checks by a licensed bat ecologist;
- Working methods (under supervision from an ecologist) to ensure minimal disturbance to bats and nesting birds, and avoidance of killing or injury to bats;
- Provision of compensatory roost features within the new proposals (modified bat loft);
- Methods to be followed in the event of a bat being discovered during works in the absence of an ecologist;
- Requirements in relation to lighting and retention of flight lines;
- Compliance checks to ensure adherence to the licensed mitigation strategy; and Post-works monitoring.

A3.2 General

This document will be available on site throughout the works and will be made available to all contractors to ensure that the requirements and mitigation measures are communicated effectively. All site workers will be briefed by a suitably qualified ecologist (hereafter referred to as ‘the ecologist’) prior to the start of works. **It is the responsibility of the site owner “the joint licensee” and project manager to ensure that this method statement is complied with during works.**

All contractors will be given a “toolbox talk” by the ecologist named on the licence at the commencement of works so that they are aware of the particular issues relating to this site and their responsibilities in the event of a bat being found in the absence of the ecologist (see below). If separate contractors are responsible for different elements of the proposed works (or if there are significant changes to works personnel), the toolbox talk will be repeated as necessary.

The toolbox talk will cover the following topics:

- that bat roosts are present;
- the legislation relating to bats;
- the measures that will be used to protect them;
- good working practices;
- licensable activities; and
- what to do should bats be found in the absence of an ecologist.

This information will be provided before any works commence on site and a written record that this has been undertaken will be kept.

A3.3 Provision of bat boxes

Prior to works commencing, at least two bat boxes will be installed on a mature tree to the south of the dwelling within the garden. The bat boxes will provide alternative bat roosting habitat for the duration of the works period and act as a safe place to put any bats found during the works conducted under licence. The exact location, height and orientation will be agreed with the ecologist during works. Licence conditions stipulate that bat boxes must be retained for a minimum of 5 years – if used by bats they may not be removed without a licence.

Suitable bat boxes include Schwegler 2FN and Schwegler 2F bat boxes, or functionally similar products.

A3.4 Roost Retention

The common pipistrelle day roost behind hanging tiles on the south-west corner will be retained (Figures A3.1-A3.3). However, the roost is likely to be temporarily obstructed by scaffolding for the duration of works.

Mitigation

Given the roost is for a single bat of a common species which will be retained for the long-term, no roost compensation (beyond the provision of bat boxes in a tree) is required, especially as the bat evidently uses other roost sites nearby, having not been present on the first bat activity survey.

A3.5 Roost Modification

Rationale for mitigation design

The proposals include a partial loft conversion which will result in the loss of approximately 50% of the existing space available to brown long-eared bats. The principal north to south-oriented loft will be sub-divided to enable retention of a 'bat loft' to the south of the central chimney breast (including retention of the identified brown long-eared bat access point), with the area of loft to the north of the chimney breast, forming a new landing and bathroom to serve a new bedroom to be constructed in the roof space of the northern two-storey extension. This modified roost area (Figures A3.1-A3.3) will have the following dimensions:

- Height to ridge 2.65 m (as existing)
- Width at base 4.40 m (as existing)

- Length 4.50 m

The existing access will be retained, unaffected.

The smaller (east-west oriented loft) will be extended with new rear and front-facing dormers and converted to form a new study and will not be available for use by bats. The new dormers will not affect identified access points or flightlines for the modified roost.

The loss of overall roost volume will be compensated in part by the addition of a variety of roosting crevices that provide a wider range of environmental conditions than those currently present.

It is likely the retention of a loft (albeit of smaller volume) within the same overall roost structure is more likely to provide successful mitigation for brown long-eared bats than a larger roost in a new structure. Studies have shown that *'In cases where roosts were modified primarily because of re-roofing work, there was no significant difference in population size before and after development for brown long-eared bats'* and that where roosts were destroyed and the mitigation strategy involved the use of either a new bat loft/house, that that *'there was a significant difference [a decrease] between the numbers of individuals recorded pre- and post-development'* for brown long-eared bats *'it was found that only 19% of pre-construction roosts above this threshold (10 individuals) retained at least this number post-development, and 69% of these roosts did not retain bats at all'* (Lintott and Mathews, 2018).

In this instance, more significant works are proposed than re-roofing alone, with loss of a significant volume of the roost (approximately 50% of overall volume). Nonetheless, the retention and modification of part of the existing roost is considered likely to provide better outcomes for the bats present than a new bat loft in a different structure within the curtilage of 103 Lonsdale Road.

The proposed 'bat loft' area is where the majority of bat droppings were found during the PRA (See Figure 3.1) and where most bats were observed during inspection surveys (See Figures 3.1 & 3.2), indicating this as the favoured roost area. This area of the loft also contains sufficient height (2.65m as existing) and volume to support the maternity use (including juvenile flight space) – it is the largest 'unobstructed void' within the current building (i.e. the area to the north of the chimney breast, which will be lost to the development is smaller in volume than the area to be retained). The existing main north-south loft void is currently separated by the central chimney breast, which effectively already partially divides the main loft into two smaller voids, with bat access between the two, possible either side of the chimney breast. It is not considered the loss of one of these volumes of loft (especially the one where there has been less evidence of bat occupation recorded), would significantly constrain the ability of the building to support a small maternity roost of brown long-eared bats in the future.

Mitigation

Any areas of the modified bat roost that require re-roofing will be lined with traditional Type 1F bitumen felt. **These areas of the roof will NOT be lined with breathable membranes or any non-woven, spun-bond or polypropylene products.** These are not

accepted by Natural England in bat licence applications because they can cause bats to become entangled in the fibres and bats can also degrade the membrane (from wear and urine) so they cease to function as intended. Where roof lining materials are required in bat mitigation structures, traditional bitumen Type 1F roofing felt will be used and the roofs ventilated accordingly in line with Building Regulations.

The installation of an artificial source of heat in the 'bat loft' to achieve consistently suitable roost temperatures (i.e. to maintain minimum roost temperatures of 30-35°C between May and August) will be considered. This will help maintain suitable conditions for breeding. The requirement for the installation of an artificial heat source will be informed by post-development monitoring of roost conditions (i.e. will only be implemented if summer roost temperatures are considered too cool for maternity use).

The access point for the 'bat loft' will be the retained ventilation slit on the south gable.

An internal, timber bat box will be created on the retained chimney breast to provide additional roosting opportunities and crawl boards will be located between alternate rafters on each roof pitch (two on each side).

A3.6 Roost Destruction

The soprano pipistrelle day roost behind hanging tiles on the north gable will be lost to enable the two-storey north gable extension and creation of a new window for the converted loft bedroom.

Mitigation

At least three new roosts will be created on the new north elevation gable, by lifting retained or replacement hanging tiles by 15 mm to enable access to the crevice behind. The precise location of these roosts will be determined by the ecologist. Indicative locations are provided in Figure A3.1 and A3.2.

A3.7 Timing

Works that will affect bat roosts will be timed to commence during the period when bats are least likely to be present. As a maternity roost is present, commencement of works will be timed to avoid summer months (May to September inclusive). However, the presence of hibernating bats cannot be ruled out, so works will also be timed to commence in the period outside when bats are in hibernation (i.e. works will only commence between October and mid-November).

Works will be timed to ensure that bats are not left without a roost and a bat box will be erected in advance of the start of works. The modified bat loft will be completed (i.e. new dividing wall installed) prior to the start of the first May following the commencement of works to ensure that brown long-eared bats are not left without a roost.

Removal of the roof structure, including roof and ridge tiles and any other roofing materials, will take place under supervision from the ecologist to ensure that bats are not harmed during the works (see Part A3.8, below).

Any works during the breeding bird season will be preceded by a check for the presence of nesting birds. If nesting birds are present and works cannot proceed without disturbing them, then works must be halted until all chicks have fledged and left the nest.

A3.8 Working Methods

Immediately prior to the commencement of works the ecologist will check the roof void internally and externally to look for any roosting bats, so far as it is safe to do so. Should any roosting bats be found they will be identified, and their numbers determined to ensure that there is no conflict with the stipulations in the licence.

All roofing materials to be removed on the building will be removed carefully by hand, with site workers briefly inspecting any potential roosting spaces so revealed for the presence of bats. The ecologist will be present during this process in order to recover any bats that are revealed. Any roosting bats revealed during this process will be transferred to the pre-installed bat boxes.

If bats are present and cannot be safely captured, or the absence of bats cannot be confirmed, then exclusion methods will be applied, to allow bats to escape but not return to the roost areas. Exclusion devices will need to remain in place for sufficient time and in suitable weather conditions to give confidence that bats have dispersed, in line with published guidance (Mitchell-Jones and McLeish, 2012; Reason, 2021). This will be advised by the ecologist (depending on the conditions at the time of exclusion), but is likely to comprise a minimum period for each device of at least seven consecutive nights throughout a spell of suitable weather conditions.

No works will be undertaken at night and the site will remain unlit during the construction period.

At other times, the named ecologist on the bat mitigation licence or an accredited agent will be available at short notice should bats be found.

A3.9 Procedures in the event of discovering a bat

All site workers will be made aware of the possibilities of finding bats and the procedure to follow should they be found when the ecologist is not on site. If at any point a bat is discovered, works will stop immediately and an ecological professional qualified to deal with bats will be contacted for advice on how to proceed. Telephone numbers of such will be held on site (Swift Ecology numbers: 01926 642541 or 07786 317722).

Should any bats fall out of structures or be injured, they will be gently placed in a secure ventilated box (*e.g.* a cardboard box) by the site worker and left in a cool dark place, until appropriate advice can be sought. Bats must not be handled without gloves.

A3.10 Retention of flight lines and control of lighting

There will be no loss of habitat connectivity and no new lighting.

A3.11 Compliance checks

The ecologist will visit the site at key stages of the works to check that the bat mitigation measures have been complied with and that all mitigation and compensation measures for bats have been implemented correctly.

A3.12 Post-development Monitoring

In line with Natural England guidance under the Earned Recognition licensing pilot (Minimum Expectations for Monitoring and Maintenance), two years of post-development monitoring will be required, with the aim to secure evidence that the compensation measures are being used for breeding. Monitoring must be staggered between years, starting after two active seasons post-impact.

A minimum of one emergence survey is required during the latter part of the maternity period (to confirm presence or absence of the maternity roost) and a further check (emergence survey or inspection as appropriate) must be undertaken post maternity peak period when young are flying (to establish breeding success) as part of each year's monitoring.

The modified roost will be monitored twice in each of the second and fourth years following completion of the development. This will be carried out by means of a loft check and an activity (dusk emergence or dawn re-entry) survey between May and August, with a second late-season inspection survey conducted between August and September.

