

**HAVANT RFC, BEDHAMPTON,
HAVANT**

**PRELIMINARY BAT ROOST
ASSESSMENT**

A Report to: CBRE Ltd

Report No: RT-MME-126764C-02

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REPORT VERIFICATION AND DECLARATION OF COMPLIANCE

This study has been undertaken in accordance with British Standard 42020:2013 “Biodiversity, Code of practice for planning and development”.

Report Version	Date	Completed by:	Checked by:	Approved by:
Final	30/11/2017	Sinéad McCarthy (Ecological Project Officer)	Dr Katy Read CEcol MCIEEM CEnv MCIWEM C.WEM DipSM (Executive Director)	Dr Philip Fermor CEnv MCIEEM (Managing Director)

The information which we have prepared 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.

DISCLAIMER

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client’s brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Middlemarch Environmental Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

VALIDITY OF DATA

The findings of this study are valid for a period of 12 months from the date of survey. If works have not commenced by this date, it may be necessary to undertake an updated survey to allow any changes in the status of bats on site to be assessed, and to inform a review of the conclusions and recommendations made.

NON-TECHNICAL SUMMARY

In November 2017, CBRE Ltd commissioned Middlemarch Environmental Ltd to undertake a Preliminary Bat Roost Assessment at Havant RFC, Bedhampton, Havant. This assessment is required to inform a planning application associated with the relaying of the existing rugby pitch with an artificial pitch and floodlights.

To fulfil the above brief to assess the potential for the existing buildings and trees on site to support roosting bats, a Preliminary Bat Roost Assessment was undertaken on 16th November 2017.

Havant RFC has been identified as having negligible potential to support roosting bats. A full external inspection of Havant RFC was conducted and no evidence of bats was found nor were any potential roosting features identified. As such no further survey work is required.

The trees and hedgerows on site have some connectivity with the surrounding landscape and therefore have suitability to support commuting and foraging bats. However, the area is already well-lit which limits the impact of the new floodlights on commuting and foraging bats. The removal of the conifer hedgerows will result in no suitable commuting and foraging features being present adjacent to the new floodlights. The closest trees and hedgerows will not be impacted by the new floodlights.

Only one mature oak tree located within the woodland on the western boundary was found to have features which included a small number of inclusion holes. This tree is not to be removed as part of the works. In addition, this tree was located away from the existing pitch and will not be impacted by the new floodlights.

Following the results of the Preliminary Bat Roost Assessment, the following recommendations have been made:

R1 Havant RFC

Havant RFC was fully inspected and no bat roost was identified. This building had no potential for roosting bats. The survey data obtained for the site is valid for 12 months from the survey date. If development works to the surveyed building have not commenced within this timeframe it will be essential to update the survey effort to establish if suitable features have developed and if bats have colonised the building in the interim. In the unlikely event that a bat is found during demolition works all works must immediately cease and a suitably qualified ecologist should be contacted.

R2 Tree T1 was considered to have low potential for roosting bats. The survey data obtained for the site is valid for 12 months from the survey date. If proposed site works have not commenced within this timeframe it will be essential to update the survey effort to establish if the tree has developed features that could be used by roosting bats in the interim. In the unlikely event that a bat is found during works to the trees all works must immediately cease and a suitably qualified ecologist should be contacted.

R3 Remaining scattered trees and Lawsons cypress hedgerows were considered to have negligible potential for roosting bats. The survey data obtained for the site is valid for 12 months from the survey date. If proposed site works have not commenced within this timeframe it will be essential to update the survey effort to establish if the trees have developed features that could be used by roosting bats in the interim. In the unlikely event that a bat is found during works to the trees all works must immediately cease and a suitably qualified ecologist should be contacted.

R4 Lighting

Bats are likely to use trees for foraging and commuting. The lighting strategy for the site should therefore be designed in accordance with good ecological practice e.g. 'Landscape and Urban Design for Bats and Biodiversity' as published by the Bat Conservation Trust (Gunnell et al, 2012). It is recommended that the lighting strategy be reviewed by a suitability qualified ecologist prior to implementation to ensure that the potential for adverse impacts on biodiversity is minimised.

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1. INTRODUCTION

1.1 PROJECT BACKGROUND

In November 2017, CBRE Ltd commissioned Middlemarch Environmental Ltd to undertake a Preliminary Ground Level Bat Roost Assessment of Trees at Havant RFC, Bedhampton, Havant. This assessment is required to inform a planning application associated with the relaying of the existing rugby pitch with an artificial pitch and floodlights.

Middlemarch Environmental Ltd has carried out a Preliminary Ecological Appraisal for CBRE Ltd at this site. The findings of this survey are detailed in Report RT-MME-126764C-01.

To fulfil the above brief to assess the potential for the existing buildings and trees on site to support roosting bats, a Preliminary Bat Roost Assessment was undertaken on 16th November 2017.

All UK bat species are European protected species and they are capable of being material considerations in the planning process. A summary of the legislation protecting bats is included within Appendix 1. This section also provides some brief information on the ecology of British bat species.

1.2 SITE DESCRIPTION AND CONTEXT

The rectangular site, which measures approximately 1 ha, is located within a predominately residential area of Bedhampton, Havant, centred at National Grid Reference SU 707 069. The site comprises the club building, associated areas of hardstanding and both grassland and artificial pitches.

Residential properties and associated gardens are located adjacent to all boundaries. The grounds of Bidbury Junior School are located to the south and Havant and South Downs College - Havant Campus grounds are located to the east of the site. Allotments and a railway line with associated vegetated banks are also located within 300 metres of the southern site boundary.

The wider landscape is dominated by residential buildings with industrial areas, school grounds and agricultural fields located further afield. The Hermitage Stream is also situated approximately 300 metres south.

1.3 DOCUMENTATION PROVIDED

The conclusions and recommendations made in this report are based on information provided by the client regarding the scope of the project. Documentation made available by the client is listed in Table 1.1.

Document Name / Drawing Number	Author
Proposed Location Plan/SIS-MUK1853-01	SIS (UK) Ltd
Proposed Site Plan/SIS-MUK1853-02	SIS(UK) Ltd

Table 1.1: Documentation Provided by Client

2. METHODOLOGY

2.1 DESK STUDY

As part of the Preliminary Ecological Appraisal (Report RT-MME-126764C-01) an ecological desk study (which included a search for records of bats) was undertaken within a 1 km radius of the site. The consultees for the desk study were:

- Natural England - *MAG/C* website for statutory conservation sites; and
- Hampshire Biodiversity Information Centre.

Middlemarch Environmental Ltd then assimilated and reviewed the desk study data provided by these organisations. Relevant bat data are discussed in Chapter 3. In compliance with the terms and conditions relating to its commercial use, the full desk study data are not provided within this report.

The desk study included a search for statutory nature conservation sites designated for bats within a 10 km radius of the site.

2.2 FIELD SURVEY

In line with the specifications detailed in Bat Mitigation Guidelines (English Nature, 2004) and Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), a Preliminary Bat Roost Assessment of the buildings and trees was conducted during daylight hours. A visual assessment was undertaken to determine the presence of any Potential Roost Features (PRFs), together with a general appraisal of the suitability of the site for foraging and commuting. Table 2.1 provides examples of PRFs. Any accessible PRFs were inspected using binoculars, a torch and endoscope for evidence of possible bat presence. Buildings were surveyed externally and internally.

Based on the PRF's present, the survey area was assessed using the suitability classes detailed within Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), as detailed in Table 2.2. Trees with features present that are suitable to support roosting bats (high and moderate suitability) are discussed more fully in the report.

A summary of the trees within the survey area without suitable features to support roosting bats (low and negligible suitability) is provided within the report. Due to their negligible potential to support roosting bats, the Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016) recommend no further survey work is required for these tree classes.

Example of Potential Roost Features	
Buildings	
<u>Externally</u>	• Access through window panes, doors and walls; • behind peeling paintwork or lifted rendering; • behind hanging tiles; • weatherboarding; • eaves; • soffit boxes; • fascias; • lead flashing; • gaps under felt (even including those of flat roofs); • under tiles/slates; • existing bat and bird boxes; and, • any gaps in brickwork or stonework permitting access into access to cavity- or rubble-filled walls.
<u>Internally</u>	• behind wooden panelling; • in lintels above doors and windows; • behind window shutters and curtains; • behind pictures, posters, furniture, peeling paintwork; • peeling wallpaper, lifted plaster and boarded-up windows;

- inside cupboards and in chimneys accessible from fireplaces.
- within attic voids;
- the top of gable end or dividing walls;
- the top of chimney breasts;
- ridge and hip beams and other roof beams;
- mortise and tenon joints;
- all beams (free-hanging bats);
- the junction of roof timbers, especially where ridge and hip beams meet;
- behind purlins;
- between tiles and the roof lining; and,
- under flat felt roofs.

Trees

- Bat, bird and dormouse boxes on trees;
- Cankers (caused by localized bark death) in which cavities have developed;
- Compression forks with included bark, forming potential cavities;
- Cracks/splits in stems or branches (both vertical and horizontal);
- Crossing stems or branches with suitable space between for roosting;
- Ivy stems with diameters in excess of 50 mm with suitable roosting space behind (or where a roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk);
- Man-made holes (e.g. cavities that have developed from flush cuts);
- Natural holes (e.g. knot holes) arising from naturally shed branches, or cavities created by branches tearing out from parent stems;
- Other hollows or cavities, including rot holes and butt rots;
- Partially detached or loose, platy bark;
- Woodpecker holes; or,
- Other features that offer a place of shelter.

Table 2.1: Potential Roost Features (Adapted from Collins 2016 and BSI 2015)

Suitability	Description
High	A 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. A tree 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.
Moderate	A 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 – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed). A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
Low	A 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). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.
Negligible	Negligible habitat features on site likely to be used by roosting bats.

Table 2.2: Classification of Buildings and Trees with Bat Potential (Adapted from Collins, 2016)

3. DESK STUDY

3.1 STATUTORY NATURE CONSERVATION SITES

The site is not located within 1 km of any statutory nature conservation sites designated for the presence of bats.

3.2 SPECIES RECORDS

Records of bat species within a 1 km radius of the survey area provided by the local record centre are summarised in Table 3.1. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area.

Species	No. of Records	Most Recent Record	Proximity of Nearest Record to Study Area	Species of Principal Importance?	Legislation / Conservation Status
Mammals - Bats					
Pipistrelle <i>Pipistrellus</i> sp.	12	2015	30 m north-east	#	ECH 4, WCA 5, WCA 6
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	14	2016	170 m north-east	✓	ECH 4, WCA 5, WCA 6
Common pipistrelle <i>Pipistrellus pipistrellus</i>	21	2017	220 m east	-	ECH 4, WCA 5, WCA 6
Unidentified myotis <i>Myotis</i> sp.	6	2013	250 m north-east	-	ECH 4, WCA 5, WCA 6
Noctule <i>Nyctalus noctula</i>	11	2017	250 m north-east	✓	ECH 4, WCA 5, WCA 6
Brown long-eared bat <i>Plecotus auritus</i>	2	1999	430 m south-east	✓	ECH 4, WCA 5, WCA 6
Serotine <i>Eptesicus serotinus</i>	9	2017	430 m east	-	ECH 4, WCA 5, WCA 6
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	1	2015	530 m east	-	ECH 4, WCA 5, WCA 6
Unidentified bat Chiroptera sp.	2	2014	570 m north	#	#
Whiskered bat <i>Myotis mystacinus</i>	1	1985	Potentially within 1 km*	-	ECH 4, WCA 5, WCA 6
Key: #: Dependent on species. *: Grid reference provided was four figures only. ECH 4: Annex IV of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest in need of strict protection. WCA 5: Schedule 5 of Wildlife and Countryside Act 1981 (as amended). Protected animals (other than birds). WCA 6: Schedule 6 of Wildlife and Countryside Act 1981 (as amended). Animals which may not be killed or taken by certain methods. Note. These tables do not include reference to the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats), the Bonn Convention on the Conservation of Migratory Species of Wild Animals or the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).					

Table 3.1: Bat Species Records Within 1 km of Survey Area

4. SURVEY RESULTS

4.1 INTRODUCTION

The Preliminary Ground Level Roost Bat Assessment of Trees was conducted on 16th November 2017 by Penelope Holgate, Ecological Consultant, Licence Number 2015-14131-CLS-CLS and Sinéad McCarthy, Ecological Project Officer.

Weather conditions were recorded and are presented in Table 4.1.

Parameter	Conditions
Temperature (°C)	13
Cloud Cover (%)	100
Precipitation	Dry
Wind Speed (Beaufort)	1-2

Table 4.1: Weather Conditions During the Preliminary Ground Level Bat Roost Assessment

4.2 CONSTRAINTS

No significant constraints were experienced at the time of the survey.

4.3 SURVEY RESULTS – BUILDINGS

4.3.1 Havant RFC

External Assessment

Havant RFC was a large multi-storey brick building with a flat felt roof (Plate 4.1). The building was in generally good condition with no gaps or missing mortar identified within the brickwork that could be utilised by roosting bats. (Plate 4.2).



Plate 4.1: Havant RFC



Plate 4.2: Brickwork in Good Condition

The northern elevation of the building had a spectator stand with metal rain shelter (Plate 4.3). The stand and shelter were both in good condition with no gaps or crevices that could be utilised by roosting bats.



Plate 4.3: View of Spectator Stand

No evidence of roosting bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the external inspection.

Internal Assessment

Internally, the building had no roof voids present and therefore no internal assessment was carried out.

4.4 SURVEY RESULTS - TREES

4.4.1 Trees with Low or Negligible Potential to Support Roosting Bats

Scattered trees were present along the perimeters of the site, the trees ranged from young to mature in age and measured up to approximately 15 m in height. Species included Goat willow *Salix caprea*, English oak *Quercus robur* and silver birch *Betula pendula* oak, ash *Fraxinus excelsior*, field maple *Acer campestre* and cherry *Prunus avium*. A mature oak tree (T1) located on the western boundary was found to have inclusion holes. It was not possible to fully inspect holes due to the height at which they were located and therefore ascertain whether any suitable crevice was located within the holes to support roosting bats (Plate 4.1). The remaining scattered broadleaved trees across the site were all checked and although some of the mature trees were of sufficient size and age to contain potential roosting features, none were identified from the ground.



Plate 4.4: Mature Oak Tree With Bat Roosting Features

Three conifer hedgerows with mature Lawson's cypress trees *Chamaecyparis lawsoniana* which measured approximately 10 m in height were present around the eastern, western and northern boundaries of the main rugby pitch. All trees within the hedgerows were fully inspected from ground level and were found to contain no potential roosting features.

4.5 SITE AND SURROUNDING HABITATS

The trees, shrubs and grassland on site offer suitable foraging and commuting opportunities for bats, linking the site to alternative roosting, foraging and commuting features in the surrounding area, such as pockets of woodlands, residential dwellings and gardens. However, some of the habitats on site were considered likely to be well-lit due to the presence of street lights, which may deter some bat species from using these habitats.

The site is bordered by playing fields to the north and east and residential properties on all other sides. The wider landscape was dominated by a mixture of residential dwellings and industrial/retail units, interspersed with school sites and recreational grounds. The Hermitage Stream is located approximately 300 m to the south of the survey area and would provide bats with a valuable commute corridor in close proximity to the surveyed trees.

Habitats within 1 km of the site suitable for roosting, commuting and foraging include:

- Residential houses and associated gardens;
- Running water and standing waterbodies;
- Pockets of woodland;

- Agricultural fields with tree and hedge lined boundaries;
- Churches, schools, hospitals and associated grounds;
- Golf courses with associated open grassland habitats; and,
- Railway lines with vegetated banks.

5. DISCUSSION AND CONCLUSIONS

5.1 SUMMARY OF PROPOSALS

It is understood the existing topsoil of the existing rugby pitch to be removed and retained on site. A new synthetic grass surface will be laid. Planning proposals also include the removal of the existing three conifer hedgerows surrounding the existing rugby pitch. Six 15-metre-high floodlights will be installed in concrete piled foundations. Perimeter fencing is to be installed around the new rugby pitch, as well as a new area of hardstanding of varying widths around the perimeter fencing.

5.2 ASSESSMENT OF BUILDINGS

Havant RFC has been identified as having negligible potential to support roosting bats. A full external inspection of Havant RFC was conducted and no evidence of bats was found nor were any potential roosting features identified. As such no further survey work is required.

5.3 ASSESSMENT OF TREES

Only one mature oak tree located within the woodland on the western boundary was found to have features which included a small number of inclusion holes. This tree is not to be removed as part of the works. It was not possible to fully inspect the holes due to the height at which they were located and therefore ascertain whether any suitable crevice was located within the holes to support roosting bats. Due to the limited features, the tree was considered to have low potential to support roosting bats.

The remaining trees were all checked and although some of the trees were of sufficient size and age to contain potential roosting features, none were identified from the ground.

5.4 POTENTIAL IMPACTS ON BATS

The trees and hedgerows on site have some connectivity with the surrounding landscape and therefore have suitability to support commuting and foraging bats. However, the area is already well-lit which limits the impact of the new floodlights on commuting and foraging bats. The existing conifer hedgerow lies adjacent to the existing pitch and floodlights and is likely to be too well lit to be used by commuting and foraging bats. Furthermore, there is more suitable foraging and commuting habitat within the surrounding landscape. The closest trees and hedgerows will not be impacted by the new floodlights.

Only one mature oak tree located within the woodland on the western boundary was found to have features which included a small number of inclusion holes. This tree is not to be removed as part of the works. In addition, this tree was located away from the existing pitch and will not be impacted by the new floodlights.

6. RECOMMENDATIONS

All recommendations provided in this section are based on Middlemarch Environmental Ltd's current understanding of the site proposals, correct at the time the report was compiled. Should the proposals alter, the conclusions and recommendations made in the report should be reviewed to ensure that they remain appropriate.

R1 Havant RFC

Havant RFC was fully inspected and no bat roost was identified. This building had no potential for roosting bats. The survey data obtained for the site is valid for 12 months from the survey date. If development works to the surveyed building have not commenced within this timeframe it will be essential to update the survey effort to establish if suitable features have developed and if bats have colonised the building in the interim. In the unlikely event that a bat is found during demolition works all works must immediately cease and a suitably qualified ecologist should be contacted.

R2 Tree T1

was considered to have low potential for roosting bats. The survey data obtained for the site is valid for 12 months from the survey date. If proposed site works have not commenced within this timeframe it will be essential to update the survey effort to establish if the tree has developed features that could be used by roosting bats in the interim. In the unlikely event that a bat is found during works to the trees all works must immediately cease and a suitably qualified ecologist should be contacted.

R3 Remaining Scattered Trees and Hedgerows

were considered to have negligible potential for roosting bats. The survey data obtained for the site is valid for 12 months from the survey date. If proposed site works have not commenced within this timeframe it will be essential to update the survey effort to establish if the trees have developed features that could be used by roosting bats in the interim. In the unlikely event that a bat is found during works to the trees all works must immediately cease and a suitably qualified ecologist should be contacted.

R4 Lighting

Bats are likely to use trees for foraging and commuting. The lighting strategy for the site should therefore be designed in accordance with good ecological practice e.g. 'Landscape and Urban Design for Bats and Biodiversity' as published by the Bat Conservation Trust (Gunnell et al, 2012). It is recommended that the lighting strategy be reviewed by a suitably qualified ecologist prior to implementation to ensure that the potential for adverse impacts on biodiversity is minimised.

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APPENDIX 1

LEGISLATION

Bats and the places they use for shelter or protection (i.e. roosts) receive European protection under The Conservation of Habitats and Species Regulations 2010, as amended (Habitats Regulations 2010, as amended). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. This protection means that bats, and the places they use for shelter or protection, are capable of being a material consideration in the planning process.

Regulation 41 of the Habitats Regulations 2010 (as amended), states that a person commits an offence if they:

- deliberately capture, injure or kill a bat;
- deliberately disturb bats; or
- damage or destroy a bat roost (breeding site or resting place).

Disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong.

It is an offence under the Habitats Regulations 2010 (as amended) for any person to have in his possession or control, to transport, to sell or exchange or to offer for sale, any live or dead bats, part of a bat or anything derived from bats, which has been unlawfully taken from the wild.

Whilst broadly similar to the above legislation, the WCA 1981 (as amended) differs in the following ways:

- Section 9(1) of the WCA makes it an offence to *intentionally* kill, injure or take any protected species.
- Section 9(4)(a) of the WCA makes it an offence to *intentionally or recklessly** damage or destroy, or *obstruct access to*, any structure or place which a protected species uses for shelter or protection.
- Section 9(4)(b) of the WCA makes it an offence to *intentionally or recklessly** disturb any protected species *while it is occupying a structure or place which it uses for shelter or protection*.

*Reckless offences were added by the Countryside and Rights of Way (CROW) Act 2000.

As bats re-use the same roosts (breeding site or resting place) after periods of vacancy, legal opinion is that roosts are protected whether or not bats are present.

The following bat species are Species of Principal Importance for Nature Conservation in England: barbastelle bat *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros*.

The reader should refer to the original legislation for the definitive interpretation.

ECOLOGY

At present, 18 species of bats are known to live within the United Kingdom, of which 17 species are confirmed as breeding. All UK bat species are classed as insectivorous, feeding on a variety of invertebrates including midges, mosquitoes, lacewings, moths, beetles and small spiders.

Bats will roost within a variety of different roosting locations, included houses, farm buildings, churches, bridges, walls, trees, culverts, caves and tunnels. At different times of the year the bats roosting requirements alter and they can have different roosting locations for maternity roosts, mating roosts and hibernation roosts. Certain bat species will also change roosts throughout the bat activity season with the bat colony using the site to roost for a few days, abandoning the roost and then returning a few days or weeks later. This change can be for a variety of reasons including climatic conditions and prey availability. Bats are known live for several years and if the climatic conditions are unfavourable at a particular roost, they may abandon it for a number of years, before returning when conditions change. Due to the matriarchal nature of bat colonies, the locations of these roosts can be passed down through the generations.

Bats usually start to come out of hibernation in March and early April (weather dependent), when they start to forage and replenish the body weight lost during the hibernation period. The female bats then start to congregate together in maternity roosts prior to giving birth and a single baby is born in June or July. The female then works hard to feed her young so that they can become independent and of a sufficient weight to survive the winter before the weather gets too cold and invertebrate activity reduces. Males generally live solitary lives, or in small groups with other males, although in some species the males can be found living with the females all year. The mating season begins in the autumn. During the winter bats hibernate in safe locations which provide relatively constant conditions, although they may venture outside to forage on warmer winter nights.