

DEE PARK, READING, PHASE 2C

**PRELIMINARY BAT ROOST
ASSESSMENT**

A Report to: Dee Partnership c/o
Reading Borough Council

Report No: RT-MME-124455-02

Date: March 2017



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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	13/03/2017	Penelope Holgate GradCIEEM (Ecological Consultant)	Colin Bundy MCIEEM (Associate 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 February, 2017 Dee Partnership c/o Reading Borough Council commissioned Middlemarch Environmental Ltd to undertake a Preliminary Bat Roost Assessment at Dee Park, Reading, Phase 2C. This assessment is required to inform a planning application associated with the demolition of the existing buildings and construction of a new community centre and some residential properties.

To fulfil the above brief to assess the potential for the existing buildings on site to support roosting bats, a Preliminary Bat Roost Assessment was undertaken on 3rd March 2017.

The external inspection of the buildings on site confirmed the presence of a number of access points for bats including the broken soffits and open windows of Buildings 1 (Blocks 24 and 26) and 3 (Blocks 10 and 12). Building 1 also had a broken ceiling allowing direct access into the roof void from the open windows. It was not possible to fully inspect all the suitable features due to the height at which they were located and as such it was not possible to establish if bats had used these features to enter a roost location at the time of surveying. No evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the buildings but not all areas could be fully surveyed. As such Buildings 1 and 3 are considered to have moderate roosting potential.

Building 2 (Blocks 20 and 22) had open windows allowing access into the buildings. No evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the building however the open windows would allow access by foraging bats or bats may find roosting sites within the internal structure of the building. No evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the buildings but not all areas could be fully surveyed. As such Building 2 is considered to have low roosting potential.

The outbuildings onsite were considered to have negligible bat roosting potential.

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

R1 Buildings 1 (Blocks 24 and 26) and 3 (Blocks 10 and 12)

Buildings 1 and 3 have been identified as having moderate potential to support roosting bats. Bat Surveys: Good Practice Guidelines published by the Bat Conservation Trust (Collins, 2016) recommends that for structures with moderate bat roosting potential two separate survey visits (consisting of one dusk emergence and a separate dawn re-entry survey) be undertaken during the bat emergence/re-entry survey season to determine the presence/absence of roosting bats within the structures. The bat emergence/re-entry survey season extends from May to September. At least one of the surveys should be undertaken during the peak season for emergence/re-entry surveys between May and August.

R2 Building 2 (Blocks 20 and 22)

Building 2 has been identified as having low potential to support roosting bats. Bat Surveys: Good Practice Guidelines, published by the Bat Conservation Trust (Collins, 2016), recommends for structures with low bat roosting potential that at least one survey (consisting of either a dusk emergence survey or a dawn re-entry survey) be undertaken during the peak season for emergence/re-entry surveys (May to August) to determine the presence/absence of roosting bats within the structure.

R3 Outbuildings

The outbuildings onsite were fully inspected and no bat roosts were identified. These buildings 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 structure have not commenced within this timeframe it will be essential to update the survey effort to establish if bats have colonised the structures 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.

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1. INTRODUCTION

1.1 PROJECT BACKGROUND

In February, 2017 Dee Partnership c/o Reading Borough Council commissioned Middlemarch Environmental Ltd to undertake a Preliminary Bat Roost Assessment at Dee Park, Reading, Phase 2C. This assessment is required to inform a planning application associated with the demolition of the existing buildings and construction of a new community centre and some residential properties.

In addition, Middlemarch Environmental Ltd has been commissioned to undertake the following assessment:

- Preliminary Ecological Appraisal, the findings of which can be found in report RT-MME-124455-01

To fulfil the above brief to assess the potential for the existing buildings on site to support roosting bats, a Preliminary Bat Roost Assessment was undertaken on 3rd March 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 development site is an L shaped parcel of land approximately 0.3 ha in size, located off Thurso Close, Reading at national grid reference SU 68440 73637. The majority of the site is made up of three blocks of flats with associated hardstanding access, amenity grassland and bare ground. At the time of surveying the areas around the buildings had been subject to extensive tree and scrub cutting.

The surrounding landscape is predominantly residential with playing fields to the south west and south east and woodland to the south west. In the wider landscape, the River Thames is present to the north with areas of mixed agricultural fields and woodland patches.

2. METHODOLOGY

2.1 DESK STUDY

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

As part of the Preliminary Ecological Appraisal (Report RT-MME-124455-01) 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 was Thames Valley Environmental Records 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.

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 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 surveyed externally and internally.

For reasons of health and safety, the survey was only undertaken in areas accessible from 3.5 m ladders.

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.

Example of Potential Roost Features	
<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; and • between tiles and the roof lining.

Table 2.1: Potential Roost Features (Adapted from Collins, 2016)

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.
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).
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).
Negligible	Negligible habitat features on site likely to be used by roosting bats.

Table 2.2: Classification of Structures with Bat Potential (Adapted from Collins, 2016)

3. DESK STUDY

3.1 STATUTORY NATURE CONSERVATION SITES

The site is not located within 10 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					
Unidentified bat <i>Chiroptera</i> sp.	21	2014	350 m north-west	#	#
Common pipistrelle <i>Pipistrellus pipistrellus</i>	1	2011	560 m west	-	ECH 4, WCA 5, WCA 6
Pipistrelle <i>Pipistrellus</i> sp.	2	2007	710 m west	#	ECH 4, WCA 5, WCA 6
Key: #: Dependent on species. 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 Bat Roost Assessment was conducted on 3rd March 2017 by Penelope Holgate, Ecological Consultant, Bat Licence Number 2015-14131-CLS-CLS.

Weather conditions were recorded and are presented in Table 4.1.

Parameter	Conditions
Temperature (°C)	7
Cloud Cover (%)	10
Precipitation	0
Wind Speed (Beaufort)	0

Table 4.1: Weather Conditions During the Preliminary Bat Roost Assessment

4.2 CONSTRAINTS

No constraints were experienced at the time of the external assessment of the survey. It was not possible to fully inspect the buildings internally as it was not possible to determine how safe the structure was following damage to the building.

4.3 SURVEY RESULTS

The site included three buildings, each of which contained two blocks of flats. Two of the buildings were of an identical construction.

4.3.1 Building 1 (Blocks 24 and 26)

External Assessment

Building 1, was a two storey brick building with PVC and rendered walls (Plate 4.1). The building was in a moderate state of repair but some of the internal structure had been stripped and the glass panes of the windows either removed or boarded up. The building had a pitched slate tiled roof which was in a good state of repair with no missing, loose or misaligned tiles.

There were a number of gaps where the wooden soffits had been broken allowing access to bats into potential roosting spaces (Plate 4.2). It was not possible to inspect these areas due to the height at which they were located and therefore their roosting potential could not be determined at the time of survey.

The open windows allowed direct access into the building by bats which may use the open rooms for foraging. No evidence of bats such as droppings and feeding remains were found within the building. One area of the ceiling was broken allowing direct access into the loft space from nearby open windows (Plate 4.3).



Plate 4.1: View of Building 1 (Blocks 24 and 26).



Plate 4.2: Gaps were Present where the Soffits of Building 1 were Broken.



Plate 4.3: Broken Ceiling of Building 1.

Numerous features were recorded around the building which could be utilised by bats to gain entry into the building and potential roost locations. These features include:

- Open windows (Plate 4.1 and 4.3)
- Broken ceiling (Plate 4.3)
- Gaps where the soffit has broken (Plate 4.2)

It was not possible to inspect these features due to the height at which they were located and as such it was not possible to establish if bats had used these features to enter a roost location at the time of surveying. No evidence of roosting bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded within the features that could be fully inspected during the survey.

Internal Assessment

Internally, Building 1 had an un-trussed timber frame with a central ridge beam (Plate 4.4). The floor to apex height was approximately 1.5 m and 3 m wide. Felt sarking was present between the beams and roof tiles and the floor was insulated with fibre glass.

It was not possible to fully inspect all features within the loft space e.g. the area between the felt sarking and roof tiles, where the ceiling was broken and it was not possible to determine how safe the beams were due to damage, as such the bat roosting potential of this area could not be fully determined. Whilst no evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the building, not all areas could be fully assessed.

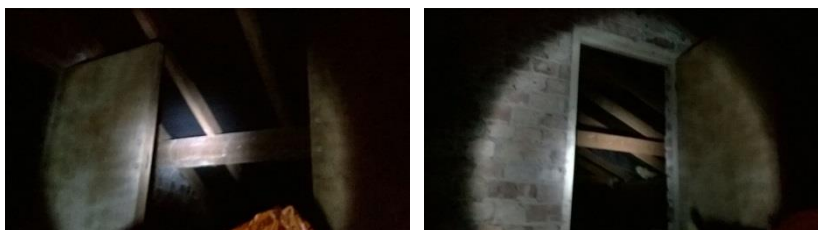


Plate 4.4: Internal view of Building 1.

Whilst no evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the buildings, not all areas could be fully assessed.

4.3.2 Buildings 2 and 3 (Blocks 20 and 22, 10 and 12 respectively)

External Assessment

Buildings 2 and 3, were three storey brick buildings with concrete and stone rendering (Plate 4.5). The buildings were in a moderate state of repair but some of the internal structure had been stripped and the glass panes of the windows either removed or boarded up. The buildings had pitched slate tiled roofs which were in a good state of repair with no missing, loose or misaligned tiles.

There was a large gap in the soffit of Building 3 (Block 12) allowing access to bats into potential roosting spaces (Plate 4.6). It was not possible to inspect this area due to the height at which it was located and therefore its roosting potential could not be determined at the time of survey.

The open windows allowed direct access into the buildings by bats which may use the open rooms for foraging. No evidence of bats such as droppings and feeding remains were found within the buildings.



Plate 4.5: View of Buildings 2 and 3 Respectively.



Plate 4.6: Broken Soffit of Building 3 (Block 12).

Features were recorded around the building which could be utilised by bats to gain entry into the building and potential roost locations. These features include:

- Open windows (4.5).
- Gaps where the soffit has broken in Building 3 (Plate 4.6).

It was not possible to inspect these features due to the height at which they were located and as such it was not possible to establish if bats had used these features to enter a roost location at the time of surveying. No evidence of roosting bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded within the features that could be fully inspected during the survey.

Internal Assessment

Internally, Buildings 2 and 3 had a trussed timber frame with a central ridge beam (Plate 4.7). The floor to apex height was approximately 3 m and 3 m wide. Felt sarking was present between the beams and roof tiles and the floor was insulated with fibre glass. A single sky light was also present in each of the buildings.

Light was seen coming in from the top of the soffits in Building 3, allowing access for bats into the internal loft space (Plate 4.8).

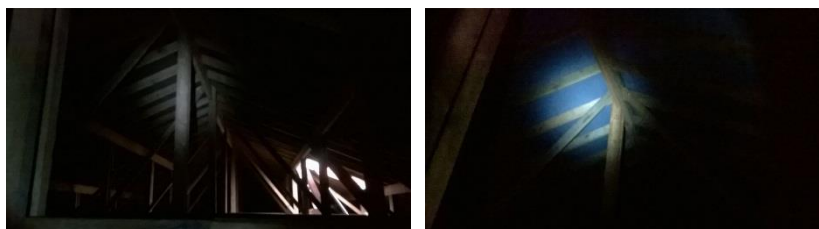


Plate 4.7: Internal view of Buildings 2 and 3.



Plate 4.8: Access into Building 3.

It was not possible to fully inspect all features within the loft space e.g. the area between the felt sarking and roof tiles, where the ceiling was broken and it was not possible to determine how safe the beams were due to damage, as such the bat roosting potential of this area could not be determined. Whilst no evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the building, not all areas could be fully assessed.

4.3.3 Outbuildings

External Assessment

Each of the blocks had a single storey concrete outbuilding used for storage (Plate 4.9). The outbuildings all had a flat felt roof which was in a good state of repair. Each of the buildings was fully assessed and no evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded and no potential roosting features were identified.



Plate 4.9: View of the Outbuildings.

Internal Assessment

Internally, the outbuildings had no roof void (Plate 4.10). The internal spaces could be fully assessed and no evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded.



Plate 4.10: Internal View of the Outbuildings.

4.3.4 Site and Surrounding Habitats

The development site was dominated by buildings and areas of hardstanding. The surrounding landscape is predominantly residential with playing fields to the south west and south east and woodland to the south west. In the wider landscape, the River Thames is present to the north with areas of mixed agricultural fields and woodland patches.

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

- Residential houses and associated gardens.
- School and associated playing fields.
- Pockets of woodland.
- Scattered trees

There is some connectivity via gardens and scattered trees between the site and the wider landscape.

5. DISCUSSION AND CONCLUSIONS

5.1 SUMMARY OF PROPOSALS

Planning proposals include the demolition of the existing buildings and construction of a new community centre and some residential properties.

5.2 ASSESSMENT OF BUILDINGS

The external inspection of the buildings on site confirmed the presence of a number of access points for bats in the broken soffits and open windows of Buildings 1 (Blocks 24 and 26) and 3 (Blocks 10 and 12). Building 1 also had a broken ceiling allowing direct access into the roof void from the open windows. It was not possible to fully inspect all the suitable features due to the height at which they were located and as such it was not possible to establish if bats had used these features to enter a roost location at the time of surveying. No evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the buildings but not all areas could be fully surveyed. As such Buildings 1 and 3 are considered to have moderate roosting potential.

Building 2 (Blocks 20 and 22) had open windows allowing access into the buildings. No evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the building however the open windows would allowing access by foraging bats or bats may find roosting sites within the internal structure of the building. No evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the buildings but not all areas could be fully surveyed. As such Building 2 is considered to have low roosting potential.

The outbuildings onsite were considered to have negligible bat roosting potential.

5.3 POTENTIAL IMPACTS ON BATS

If bats utilise buildings 1, 2, or 3, demolition of these structures is likely to result in roost destruction and kill/injury of bats.

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 Buildings 1 (Blocks 24 and 26) and 3 (Blocks 10 and 12)

Buildings 1 and 3 have been identified as having moderate potential to support roosting bats. Bat Surveys: Good Practice Guidelines published by the Bat Conservation Trust (Collins, 2016) recommends that for structures with moderate bat roosting potential two separate survey visits (consisting of one dusk emergence and a separate dawn re-entry survey) be undertaken during the bat emergence/re-entry survey season to determine the presence/absence of roosting bats within the structures. The bat emergence/re-entry survey season extends from May to September. At least one of the surveys should be undertaken during the peak season for emergence/re-entry surveys between May and August.

Should this survey confirm the presence of roosting bats, it will be necessary to undertake additional surveys in order to inform a Natural England licence application. In addition, should the survey identify the presence of significant levels of bat activity at the site, it may be necessary to undertake further survey visits to comprehensively assess the value of the site to bats.

R2 Building 2 (Blocks 20 and 22)

Building 2 has been identified as having low potential to support roosting bats. Bat Surveys: Good Practice Guidelines, published by the Bat Conservation Trust (Collins, 2016), recommends for structures with low bat roosting potential that at least one survey (consisting of either a dusk emergence survey or a dawn re-entry survey) be undertaken during the peak season for emergence/re-entry surveys (May to August) to determine the presence/absence of roosting bats within the structure.

Should this survey confirm the presence of roosting bats, it will be necessary to undertake additional surveys in order to inform a Natural England licence application. In addition, should the survey identify the presence of significant levels of bat activity at the site, it may be necessary to undertake further survey visits to comprehensively assess the value of the site to bats.

R3 Outbuildings

The outbuildings onsite were fully inspected and no bat roosts were identified. These buildings 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 structure have not commenced within this timeframe it will be essential to update the survey effort to establish if bats have colonised the structures 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.

REFERENCES AND BIBLIOGRAPHY

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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.

For England:

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.