

EAST BAY CLOSE, CARDIFF

**PRELIMINARY BAT ROOST
ASSESSMENT**

A Report to: KDP Architects

Report No: RT-MME-124930-02

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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:
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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 March 2017, KDP Architects commissioned Middlemarch Environmental Ltd to undertake a Preliminary Bat Roost Assessment at East Bay Close in Cardiff. This assessment is required to inform a planning application associated with the proposed construction of a new 711-bed student development with associated parking and ancillary facilities following the demolition of the existing car showroom buildings. It is understood that the existing trees will be removed to facilitate the new development.

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 21st March 2017.

The buildings on site were generally in good condition with no potential ingress points or roosting opportunities for bats. Therefore, they were considered to have negligible potential to support roosting bats.

The A4234 flyover had expansion gaps between the concrete panels, offering potential roosting locations for bats. Therefore, the structure was considered to have high potential to support roosting bats. These features could not be fully inspected; however, it is understood that the structure will not be directly impacted by the proposed works.

The trees on site were all fully checked and none possessed any potential roosting features for bats. Therefore, they were considered to have negligible potential to support roosting bats.

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

R1 Buildings

The buildings on site 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. 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 Trees

The trees on site 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. 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 A4234 flyover

Any lighting installed under the flyover should be low level and directional to ensure no additional increases in light levels of the structure. It is recommended that once developed, the lighting strategy for the site should be approved by a suitably qualified ecologist. If increased illumination of the flyover cannot be avoided, further bat surveys will be required to determine presence/absence of bats within the structure and identify appropriate mitigation measures where appropriate.

R4 Foraging/Commuting Bats

In line with paragraph 125 of the National Planning Policy Framework, the development should aim to limit the impact of light pollution on bats through the careful use of lighting in critical areas only and at a low level with minimum spillage. Any lighting, either temporary or permanent, at the site (especially along the northern boundary where the site abuts a railway line) should be kept to a minimum and directed away from suitable features to ensure there is no increase in light levels.

R5 Habitat Enhancement

The development should aim to enhance the site for bats. This may include the provision of roosting opportunities through the installation of bat boxes on suitable trees or new buildings, and the creation of foraging areas by planting species which attract night flying insects.

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1. INTRODUCTION

1.1 PROJECT BACKGROUND

In March 2017, KDP Architects commissioned Middlemarch Environmental Ltd to undertake a Preliminary Bat Roost Assessment at East Bay Close in Cardiff. This assessment is required to inform a planning application associated with the proposed construction of a new 711-bed student development with associated parking and ancillary facilities following the demolition of the existing car showroom buildings. It is understood that the existing trees will be removed to facilitate the new development.

In addition, Middlemarch Environmental Ltd has been commissioned to undertake a Preliminary Ecological Appraisal for KDP Architects at this site, the findings of which are detailed in report RT-MME-124930-01.

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 21st 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 site is located off East Bay Close in Cardiff, centred at National Grid Reference ST 1918 7610. It is irregular in shape and measures approximately 0.9 ha in size.

At the time of the survey, the site comprised a former car showroom and garage, a temporary car showroom and several portacabins used as offices with associated areas of hardstanding. A small area of improved grassland was present along the southern boundary next to East Bay Close. Several scattered trees and patches of scattered scrub were present along the perimeter of the site. The A4234 flyover passes over the western part of the survey area.

The site was bordered by a railway line to the north, an industrial depot to the east, East Bay Close to the south and a large warehouse to the west. The wider landscape was dominated by an urban setting consisting of a mixture of industrial units, retail units, offices and residential dwellings interspersed with school grounds and recreational grounds. Bute East Dock is located 130 m to the 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
Existing Site Plan: 1437 100 Rev A	KDP Architects
Proposed Site Plan: 1437 101 Rev A	KDP Architects

Table 1.1: Documentation Provided by Client

The Proposed Site Plan is included in Chapter 7.

2. METHODOLOGY

2.1 DESK STUDY

As part of the Preliminary Ecological Appraisal (Report RT-MME-124930-01) an ecological desk study (which included a search for records of bats) was undertaken within a 1 km radius of the site. The consultee for the desk study was South-East Wales Biodiversity Records Centre (SEWBRec).

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. 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. 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>	<ul style="list-style-type: none"> • 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.

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

Example of Potential Roost Features	
<p><u>Internally</u></p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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. <p>Trees</p> <ul style="list-style-type: none"> • 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 (cont'd): Potential Roost Features (Adapted from Collins 2016 and BSI 2015)

Suitability	Description
High	<p>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.</p> <p>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.</p>
Moderate	<p>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).</p> <p>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).</p>
Low	<p>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).</p> <p>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.</p>
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 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	Section 42 Species?	Legislation
Common pipistrelle <i>Pipistrellus pipistrellus</i>	6	2016	160 m south	✓	ECH 4, WCA 5, WCA 6
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	4	2016	160 m south	✓	ECH 4, WCA 5, WCA 6
Unidentified species <i>Chiroptera</i> sp.	11	2012	160 m south	#	ECH 2 #, ECH 4, WCA 5, WCA 6
Pipistrelle species <i>Pipistrellus</i> sp.	6	2012	300 m north-east	#	ECH 4, WCA 5, WCA 6
<p>Key: #: Dependent on species.</p> <p>ECH 2: Annex II of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation.</p> <p>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.</p> <p>WCA 5: Schedule 5 of Wildlife and Countryside Act 1981 (as amended). Protected animals (other than birds).</p> <p>WCA 6: Schedule 6 of Wildlife and Countryside Act 1981 (as amended). Animals which may not be killed or taken by certain methods.</p> <p>Section 42 Species: Species of Principal Importance for Conservation of Biological Diversity in Wales.</p>					

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 21st March 2017 by Sophie Meredith (Senior Ecological Consultant). Drawing C124930-02-01, illustrating the layout of the buildings on site and the results of the survey is provided in Chapter 7.

Weather conditions were recorded and are presented in Table 4.1.

Parameter	Conditions
Temperature (°C)	7
Cloud Cover (%)	60
Precipitation	Nil
Wind Speed (Beaufort)	F1

Table 4.1: Weather Conditions During the Preliminary Bat Roost Assessment

4.2 CONSTRAINTS

No constraints were experienced during the survey.

4.3 SURVEY RESULTS – BUILDINGS AND STRUCTURES

4.3.1 Building 1 – Former Car Showroom and Garage

External Assessment

A former car showroom and garage was located in the centre of the site. This was a large, single-storey building with a pitched, corrugated metal roof and raised ridge section (Plate 4.1). The lower half of the walls was constructed of brick whilst the upper half was constructed of corrugated metal sheets. No cracks or crevices were present in the brickwork and the metal sheets were tightly fitted. The southern elevation comprised a large glass frontage with windows set in tightly fitted metal frames. The metal soffits were predominantly tightly fitted and the roof was well-sealed. A gap was noted in the south-eastern corner of the soffit where two panels were not tightly sealed. However, this was filled with insulation making it unsuitable as an access point or roosting feature for bats. No potential ingress points or roosting opportunities for bats were identified. No evidence of bats was recorded.



Plate 4.1: Former car showroom and garage

Internal Assessment

Internally, the building was divided into two sections; the former showroom and the garage. The former showroom occupied the southern half of the building and was vacant at the time of the survey (Plate 4.2). Conditions within this area were very light due to the large glass frontage, reducing its suitability for bats. Wooden boards were visible at the gable end where one of the internal panels was missing but no potential roosting features were identified (Plate 4.3). The former showroom had a false ceiling which was damaged in places revealing the roof structure above (Plate 4.4). The exposed corrugated metal roof and steel beams offer negligible roosting potential for bats.

The garage occupied the northern half of the building and was in use at the time of the survey (Plate 4.5). Conditions within this area were very light due to the presence of skylights, reducing its suitability for bats. The garage was open plan revealing the same roof structure that was visible in the former showroom. No features suitable for use by bats were identified during the internal assessment and no evidence of bats was recorded.



Plate 4.2: Interior of former showroom



Plate 4.3: Wooden board visible at gable end



Plate 4.4: Roof structure visible through area of damaged ceiling



Plate 4.5: Garage area still in use

4.3.2 Building 2 – Temporary Car Showroom

External Assessment

A temporary car showroom was present in the eastern part of the site. This was a single-storey, steel-framed building of prefabricated construction with a pitched, plastic roof (Plate 4.6). The western elevation comprised a large glass frontage with windows set in tightly fitted metal frames. The building was in good condition with no potential ingress points or roosting opportunities for bats. No evidence of bats was recorded.



Plate 4.6: Temporary Car Showroom

Internal Assessment

The temporary car showroom was in use at the time of the survey. Conditions within this building were very light due to the large glass frontage, reducing its suitability for bats. It was open plan with the exposed corrugated metal roof and steel beams offering negligible roosting potential for bats. No other features suitable for use by bats were identified during the internal assessment and no evidence of bats was recorded.

4.3.3 Building 3 – Portacabins

A group of six portacabins was present in the north-eastern part of the site (Plate 4.7). These were being used as sales offices and public toilets at the time of the survey. They were in good condition with no potential ingress points or roosting opportunities for bats. No evidence of bats was recorded.



Plate 4.7: Portacabins

4.3.4 A4234 flyover

The A4234 flyover passes over the western part of the survey area (Plate 4.8). This was a large concrete structure with concrete supports. Expansion gaps were present between the concrete panels, offering potential roosting features for bats (Plate 4.9). These features could not be fully inspected; however, it is understood that the structure will not be impacted by the proposed works.



Plate 4.8: A4234 flyover



Plate 4.9: Expansion gaps between concrete panels

4.4 SURVEY RESULTS – TREES

A small number of trees were present within the survey area. These ranged from young to early-mature in age and measured up to approximately 12 m in height. Species included cherry *Prunus* sp., cypress *Cupressaceae* sp., Italian alder *Alnus cordata*, paper birch *Betula papyrifera* and purple-leaved plum *Prunus cerasifera* var *nigra*. The trees were all fully checked and none possessed any potential roosting features.

4.5 SITE AND SURROUNDING HABITATS

The grassland, scrub and trees on site offer suitable foraging opportunities for bats, albeit limited in extent. However, they link the site to alternative roosting, foraging and commuting habitats in the surrounding area including the adjacent railway line with vegetated banks. Therefore, the habitats on site were considered to have potential to be used by bats.

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

- Residential houses and associated gardens;
- Running water and standing waterbodies;
- Churches, schools, hospitals and associated grounds;
- Recreational grounds with associated open grassland habitats; and,
- Railway lines with vegetated banks.

5. DISCUSSION AND CONCLUSIONS

5.1 SUMMARY OF PROPOSALS

Proposals involve the construction of a new 711-bed student development with associated parking and ancillary facilities following the demolition of the existing car showroom buildings. It is understood that all of the existing trees will be removed to facilitate the new development, and new tree and shrub planting is to be incorporated into the soft landscaping.

5.2 ASSESSMENT OF BUILDINGS AND STRUCTURES

The buildings on site were generally in good condition with no potential ingress points or roosting opportunities for bats. Therefore, they were considered to have negligible potential to support roosting bats.

The A4234 flyover had expansion gaps between the concrete panels, offering potential roosting locations for bats. Therefore, the structure was considered to have high potential to support roosting bats. These features could not be fully inspected; however, it is understood that the structure will not be directly impacted by the proposed works.

5.3 ASSESSMENT OF TREES

The trees on site were all fully checked and none possessed any potential roosting features for bats. Therefore, they were considered to have negligible potential to support roosting bats.

5.4 POTENTIAL IMPACTS ON BATS

As the buildings and trees on site have negligible potential to support roosting bats, the proposed demolition works and tree removal works are not expected to impact roosting bats. Therefore, the works may proceed as scheduled.

The flyover which passes over the site will not be directly impacted by the proposed development. However, the proposed site plan indicates that a volleyball court and basketball court are to be constructed below the flyover. It is not known whether these features are to be lit during the evenings. Any additional lighting installed on site has the potential to illuminate potential bat roosting features within the flyover and therefore impact bat roosting locations. As a result, a recommendation has been made in Chapter 6.

Due to the small extent of semi-natural habitats on site and the presence of suitable foraging grounds in the wider landscape it is not considered that the loss of habitats on site will impact upon foraging/commuting bats. The proposed plans show tree and shrub planting is to be incorporated into the new development, which could positively enhance the site for foraging bats. To increase the value of the site for bats, a recommendation is made in Chapter 6 regarding the provision of roosting opportunities and suitable plant species to incorporate into the soft landscaping to attract night flying insects.

It should be noted that the railway corridor which borders the site to the north offers a potential commute feature for bats. Any additional lighting installed on site either during or post construction could result in the fragmentation of this potential commute feature. A recommendation regarding lighting is made in Chapter 6.

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

The buildings on site 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 buildings 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 buildings 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 Trees

The trees on site 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.

R3 A4234 flyover

Any lighting installed under the flyover should be low level and directional to ensure no additional increases in light levels of the structure. It is recommended that once developed the lighting strategy for the site should be approved by a suitably qualified ecologist. If increased illumination of the flyover cannot be avoided further bat surveys will be required to determine presence/absence of bats within the structure and identify appropriate mitigation measures where appropriate.

R4 Foraging/Commuting Bats

In line with paragraph 125 of the National Planning Policy Framework, the development should aim to limit the impact of light pollution on bats through the careful use of lighting in critical areas only and at a low level with minimum spillage. Any lighting, either temporary or permanent, at the site (especially along the northern boundary where the site abuts a railway line) should be kept to a minimum and directed away from suitable features to ensure there is no increase in light levels.

R5 Habitat Enhancement

In line with the National Planning Policy Framework, the development should aim to enhance the site for bats. Bat boxes should be installed to provide roosting habitat for species such as pipistrelle. In general, bats seek warm places and for this reason boxes should be located where they will receive full/partial sun, although installing boxes in a variety of orientations will provide a range of climatic conditions. Position boxes at least 3 m above ground to prevent disturbance from people and/or predators. The planting of species which attract night flying insects is encouraged as this will be of value to foraging bats, for example: evening primrose *Oenothera biennis*, goldenrod *Solidago virgaurea*, honeysuckle *Lonicera periclymenum* and fleabane *Pulicaria dysenterica*.

7. DRAWINGS

Drawing C124930-02-01 – Preliminary Bat Roost Assessment



Legend

- Tree with negligible roosting potential
- Building
- Site boundary
- Phase 1 Habitats:**
- X Scattered scrub
- Fence
- Bare ground
- Hardstanding
- Improved grassland
- Hardstanding (flyover crossing site)

Project		East Bay Close, Cardiff	
Drawing		Preliminary Bat Roost Assessment	
Client		KDP Architects	
Drawing Number	C124930-02-01	Revision	00
Scale @ A4	1:900	Date	March 2017
Approved By	SM	Drawn By	GP
			
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C124930-02-01



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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 listed Species of Principal Importance for Nature Conservation in Wales: barbastelle bat *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus*, 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.