

**ecological support, management &
solutions**



Bat Mitigation Strategy

Blendworth Crescent

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1.0 INTRODUCTION

1.1 Brief

Ecosupport Ltd was commissioned by Portsmouth City Council to conduct a Phase I Survey of the land at Blendworth Crescent in Spring 2015. The result of this survey led to the recommendation and subsequent execution of a range of Phase II protected species surveys, including bat transects to assess how they utilise the site.

As part of the Phase I process, a data request was submitted to Hampshire Biodiversity Information Centre (HBIC) the results of which did not present any cause for concern nor indicated that the site in question was of significant importance for bat species. Later conversations with the Hampshire Bat Group identified the close proximity of a significant Serotine (*Eptesicus serotinus*) roost within one of the neighbouring properties. As a result this Mitigation Strategy has been developed to ensure that the bats within this historic roost are not impacted.

1.2 Aims of the Mitigation Strategy

This mitigation strategy has been produced to ensure that both foraging and commuting bats are not negatively impacted by proposals.

1.3 Legal Protection of Bats

Due to the decline in bat numbers, all species in England and Wales are protected by the Wildlife and Countryside Act (1981) (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006) and by the Conservation of Habitats and Species Regulations (2010).

This makes it an illegal offence to deliberately capture, injure or kill a bat, intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats, damage or destroy a bat roosting place (even if bats are not occupying the roost at the time), possess or advertise/sell/exchange a bat (dead or alive) and to intentionally or recklessly obstruct access to a bat roost.

1.4 The Status of Bats on Site

1.4.1 Phase II Survey Methodology

The site was classified as 'Small' consisting of 'Low quality habitat' as per the BCT guidelines. As a result two transect surveys were carried out, in order to inform the lighting strategy.

The transect surveys involved experienced surveyors of ecosupport Ltd. on foot carrying bat detectors along a route throughout the site. Surveyors walked at a constant speed recording bat passes, logging echolocations for subsequent analysis and noting associated details such as species, time and direction of flight. Spot

counts were also incorporated within the survey design. This involved standing at set points along the transect for an allotted period of time and recording all activity (**Figure 1**). During the first survey, surveyors went clockwise around the site. During the second survey the direction was reversed as the surveys walked anti-clockwise. This allowed the surveyors to gain a better insight into the usage of specific areas of the site at different times. The surveys started just before sunset and continued for two hours.

Figure 1. Transect Route.



1.4.2 Phase II Results

The dates and information on survey conditions are provided in **Table 1**. Activity was concentrated within the eastern extent of the site particularly the southeastern corner where high levels of foraging from both Common and Soprano Pipistrelles (*Pipistrellus pipistrellus* and *pygmaeus*) was recorded.

Table 1. Relevant survey information.

Date	Temp (°C)	Cloud Cover (%)	Wind	Start time	Finish time
06/07/2015	17	20	None	21:15	23:19
18/08/2015	17	100	None	20:15	22:20

6th July 2015

The majority of activity recorded was that of Common and Soprano Pipistrelles as they utilised the site for both foraging and commuting (**Table 2**). Activity where the location of the bat could not be identified was referred to as heard but not seen (HNS). In these instances it was considered likely the bats were offsite and within

neighbouring land. Nathusius' Pipistrelle (*Pipistrellus nathusii*) bats were recorded within the grounds of Trosnant Junior School to the south of the site however they were not recorded within the site boundary itself. Similarly a Noctule (*Nyctalus noctula*) and Serotine (*Eptesicus serotinus*) bat was recorded within the nearby vicinity. They were not seen over the proposed development site therefore their exact location off site was unable to be confirmed due to the lack of a visual.

Table 2. Bat Activity During the First Survey.

Point No.	Start Time at Point	Time of Activity	Species	Activity	Direction of Flight
1	21:15				
3	22:36	21:50	Common Pipistrelle	Commute	HNS
		21:51	Common Pipistrelle	Forage	Southeast corner
3	22:52	21:54	Soprano Pipistrelle	Forage	Southeast corner
		21:55	Common and Soprano Pipistrelle	Forage	Southeast corner
		21:58	Common Pipistrelle	Commute	Northwest along residential gardens

4	22:07	22:08	Common Pipistrelle	Commute	West
		22:09	Nathusius' Pipistrelle	Commute	Within the grounds of Trosnant Junior School
		22:11	Common Pipistrelle	Commute	East
		22:14	Common Pipistrelle	Commute	West
			Noctule	Commute	HNS
		22:17	Common Pipistrelle	Commute	HNS
		22:18	Nathusius' Pipistrelle	Commute	Within the grounds of Trosnant Junior School
5	22:23	22:23	Common Pipistrelle	Commute	East
		22:25	Common Pipistrelle	Commute and Forage	Northwest
		22:28	Nathusius' Pipistrelle	Commute	Within the grounds of Trosnant Junior School
		22:32	Nathusius' Pipistrelle	Commute	Within the grounds of Trosnant Junior School
		22:34	Soprano	Commute	HNS

		22:35	Pipistrelle Soprano Pipistrelle	Commute	HNS
6	22:37	22:43	Serotine	Commute	HNS
		22:50	Common Pipistrelle	Forage	South
7	22:57	22:58	Common Pipistrelle	Distant commute	HNS
		23:01	Common Pipistrelle	Commute	Northeast

18th August 2015

The same assemblage of bat species was recorded on site on this occasion as during the first survey with the addition of two Serotine bats recorded in pursuit of each other on two instances (**Table 3**). Again bat activity was focused along the edges of the site as they utilised the linear scrub feature as commuting routes and fed of the insects that the vegetation attracted.

Table 3. Bat activity on site during the second activity survey.

Point No.	Start Time at Point	Time of Activity	Species	Activity	Direction of Flight
1	20:20				
2	20:35	20:38	Common Pipistrelle	Commute	Northeast
		20:44	Common Pipistrelle	Commute	East
		20:46 – 20:48	Soprano Pipistrelle	Forage	Northwest corner
		20:49	2 x Serotine	Commute	Northwest
3	20:50	20:53	Soprano Pipistrelle	Forage	Southwest corner
		20:54	Common Pipistrelle	Forage	HNS

		20:55	2 x Serotine	Commute & Forage	Along western boundary
		20:57	Soprano Pipistrelle	Commute	South
		20:58	Soprano Pipistrelle	Forage	Southwest corner
		20:59	Common Pipistrelle	Commute	HNS
		21:01	Soprano Pipistrelle	Forage	Southwest corner
		21:04	Soprano Pipistrelle	Forage	Southwest corner
		21:04	2 x Common Pipistrelle	Commute	East along southern hedge
4	21:05				
5	21:20	21:22	Soprano Pipistrelle	Commute	HNS
		21:24	Nathusius' Pipistrelle	Commute	HNS
		21:27	Nathusius' Pipistrelle	Commute	HNS
		21:31	Common Pipistrelle	Commute & Forage	HNS
		21:33	Common Pipistrelle	Commute	West
6	21:35	21:35 – 21:50	Common and Soprano Pipistrelle	Forage	Within gardens & above tree
7	21:50	21:53	Common	Commute	West

		21:59	Pipistrelle Common Pipistrelle	Commute	East
		21:05	Common Pipistrelle	Commute	HNS

1.5 Valuation

Common and Soprano Pipistrelle and Serotine bats were recorded on site with Noctule and Nathusius' Pipistrelles recorded in the nearby vicinity. Common and Soprano Pipistrelle bats fall within the 'common' category of bats with Serotine falling within the 'rarer' category (Wray *et al* 2010). Similarly, Nathusius' Pipistrelle and Noctule are also considered to be example of 'rarer' bats. A roost has been identified nearby to the site therefore using the points-based system, developed by Wray *et al.* (2010), a score of 21 points for commuting and 20 points foraging bats was produced (see **Table 4**). This classifies the site as **county value** for commuting bats and **local value** for foraging.

Table 4. Valuation of habitat for (a) commuting and (b) foraging bats (Wray *et al.* 2010).

Species	Number of bats	Roosts nearby	Habitat features
(a) Commuting habitat			
Common (2)	Individual bats (5)	None (1)	Absence of (other) linear features (1)
		Small number (3)	Un-vegetated fences and large field sizes (2)
Rarer (5)	Small numbers (10)	Moderate number/not known (4)	Walls, gappy or flailed hedges, isolated well grown hedges, moderate field sizes (3)
		Large number of roosts or close to a SSSI for the species (5)	Well grown and well connected hedges, small field sizes (4)
Rarest (20)	Large numbers (20)	Close or within a SAC for the species (20)	Complex network of well-established hedges, small fields and rivers/streams (5)

(b) Foraging habitat			
Common (2)	Individual bats (5)	None (1)	Industrial or other site without established legislation (1)
		Small number (3)	Suburban areas or intensive arable land (2)
Rarer (5)	Small numbers (10)	Moderate number/not known (4)	Isolated woodland patches, less intensive arable and/or small towns/villages (3)
		Large number of roosts or close to a SSSI for the species (5)	Larger or connected woodland blocks, mixed agriculture and small villages/hamlets (4)
Rarest (20)	Large numbers (20)	Close or within a SAC for the species (20)	Mosaic of pasture, woodlands and wetland areas (5)

2.0 POTENTIAL IMPACTS IN THE ABSENCE OF MITIGATION

2.1 Loss of Foraging Habitat and Commuter Routes

Although Serotine bats can forage up to 6km from their roost most of their prey is caught within 2km (BCT, 2010). Therefore this site is likely to provide important foraging habitat. If insufficient areas are retained and new landscaping is not suitable for attracting insects then this would likely have an impact on the viability of the site supporting foraging Serotine bats. The Bat Conservation Trust (2010) considered it likely that the decline in Serotine numbers is due to the loss of feeding habitat where large insects are found.

Serotine bats fly at a height of around 10m often close to vegetation (BCT, 2010). Therefore the boundary vegetation around the periphery of the site, including the standard trees, provides ideal commuter routes. This was confirmed during the Phase II transect surveys. The western boundary and the northwestern stretch of the site have been recorded as the flight paths for Serotines occupying the roost within the neighbouring property (**Figure 2**). (Established via conversations with Hampshire Bat Group and during the Phase II survey work). If the development does not take this into consideration bats may be deterred from returning to the historic roost site.

Figure 2. Recorded and anecdotal flight paths of Serotine bats on site.



2.2 Increased Light Levels

Studies have shown that, although Noctules (*Nyctalus noctula*), Leisler's (*Nyctalus leisleri*), Serotine and Pipistrelle bats swarm around white mercury and metal halide street lights, this behaviour is not true for all species (BCT, 2009). The slower flying broad winged species such as Long-eared (*Plecotus Sp.*) bats, Myotis species, Barbastelle (*Barbastella barbastellus*) and Horseshoe (*Rhinolophidae Sp.*) bats generally avoid street lights (BCT, 2009). In addition it is also thought that insects are

attracted to lit areas from further afield resulting in depletion of feeding sources elsewhere.

Artificial lighting is also thought to increase the risk of predation. For example observations have been made of Kestrels (*Falco tinnunculus*) hunting at night under the artificial light along motorways (BCT, 2009). Therefore increased light levels may lead to increases in mortality.

Bright light may reduce social flight activity and cause bats to move away from the light area. Studies have shown that continuous lighting along roads creates barriers which some bat species cannot cross. For example, Daubenton's (*Myotis daubentonii*) bats move their flight paths to avoid street lamps (BCT, 2009).

3.0 MITIGATION – LIGHTING STRATEGY

The following information has been taken from the Bat Conservation Trust (BCT) publication 'Bats and Lighting in the UK' (2009). The working document has been produced for lighting engineers and designers, planning officers, developers and bat workers.

3.1 Type of Lamp

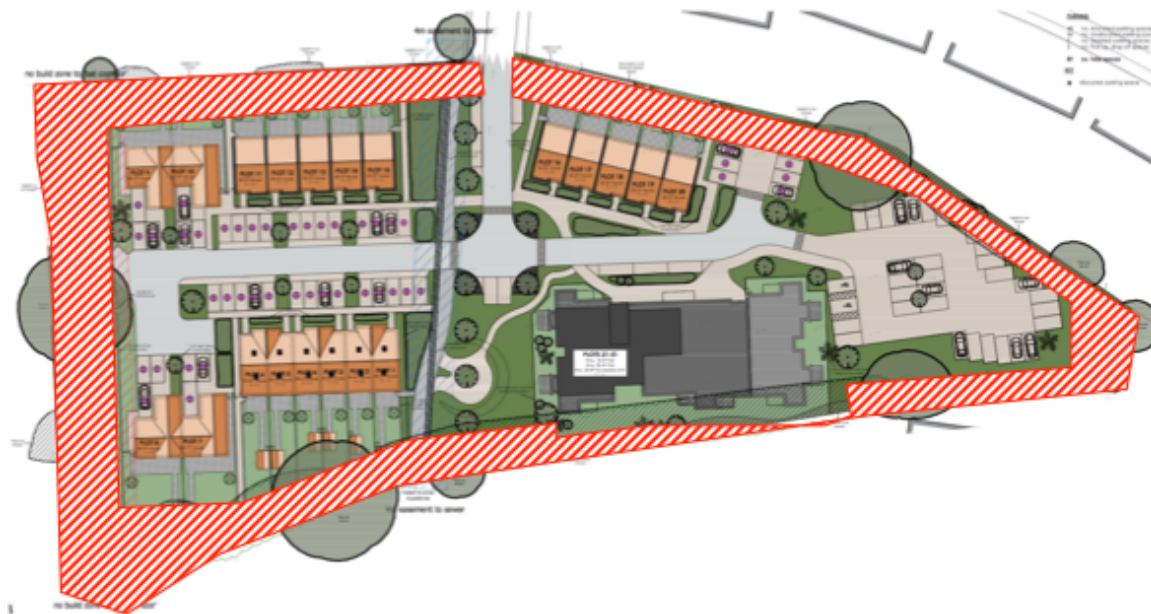
Low or high-pressure sodium lamps will be used on site instead of mercury or metal halide lamps*. Glass glazing is preferred due to its UV filtration characteristics. Light sources that emit minimal ultra-violet light and avoid the white and blue wavelengths of the light spectrum avoid attracting lots of insects. This is favourable if not it can lead to a reduction of insects in other areas and it can dramatically alter the assemblage of bats on site.

**White LED lights do not emit UV but have still been shown to disturb slow-flying bat species.*

3.2 Luminaire and Light Spill Accessories

Where street lighting is a necessity, lighting should be directed to where it is needed and light spillage avoided. This will be achieved by the design of the luminaire and by using hoods to direct the light to the intended area only. There will be minimal to no light pollution reaching the boundary vegetation as demonstrated in **Figure 3**.

Figure 3. Dark corridors to be maintained.



3.3 Lighting column

The height of lighting columns should be as short as is possible. For the parking areas low level sodium bollard lighting (**Figure 4**) should be used as opposed to tall column

lighting.

Figure 4. Example of bollard lighting.



3.4 Light levels

The lighting on site will be as low as guidelines permit. If lighting is not needed it will not be installed.

3.5 Timing of lighting

The times during which the lighting is on should be limited to provide some dark periods. Therefore security lighting will be sensor activated. **Figure 5** below demonstrates where these should be located to minimise light spillage onto boundary vegetation.

Figure 5. Location of sensor activated security lighting.



3.6 Planting

Planting can also be used as a barrier to prevent light spillage into adjacent sites. By retaining the boundary vegetation this will contribute to ensuring light does not impact bats in the neighbouring gardens.

4.0 MITIGATION – VEGETATION RETENTION & PLANTING SCHEDULE

The following information is taken from the guidance produced by the Bat Conservation Trust (Gunnell et al. 2012). The publication is a useful resource for landscape architects when designing habitats for bats and the insects they feed off.

4.1 Landscape Connectivity

Many bat species are reluctant to leave the cover of features such as tree lines and hedges as they move between their roost and foraging grounds. Fragmentation of the landscape can therefore be a serious issue for bats. Therefore boundary vegetation will be retained.

In addition the proposed layout has been altered as to retain a 'Bat Corridor' along the western extent of the site (evident in **Figure 3** and **5**). This was the area with the highest recorded Serotine activity during the Phase II survey in 2015. Similarly the northern section of the site is to form the garden spaces associated with the new dwellings. This will maintain a linear route along the northern extent of the site. This will be enhanced through the introduction of native floral species within the gardens.

4.2 Attracting Nocturnal Flying Insects

Planting a mixture of flowering plants, trees (including fruit trees) and shrubs encourages a diversity of insects to sustain bats. It is beneficial that the flowers vary in colour (although pale flowers that are more easily seen in poor light and so attract insects at dusk), fragrance, shape, amount of nectar and time of flowering. (It is important to provide native flowering plants, shrubs and trees throughout spring, summer and autumn). Flowers with 'landing platforms' for insects (i.e. flowers from the Daisy and Carrot families) increase opportunities for insects and in turn foraging bats.

4.3 Trees

Native trees are important to foraging bats. Key species are Willow, Birch and Oak as they can support high numbers of insects. In addition once matured they can then provide roosting opportunities (see **Table 5** below).

Table 5. Tree species for foraging and roosting potential (Gunnel et al. 2012).

Native Tree species	Roosting potential	Supporting foraging
Oak	Very good	Very good
Willow	Minimal	Very good
Beech	Very good	Good
Ash	Good	Good
Elm	Good	Good
Birch	Minimal	Very good

4.4 Landscape Plan

The Landscape plan supporting the development will contain a number of species which have been highlighted within the guidelines produced by the Bat Conservation Trust. The ornamental planting list will be composed taking into consideration the species outlined (see **Appendix I** for list of species).

5.0 BAT ROOST FEATURES

In the interest of promoting ecology and to keep in line with National and Local policy it was recommended that a number of bat boxes are integrated within at least five of the new dwellings. The Bat Box C design has been designed specifically for crevice dwelling bat species such as the Common and Soprano Pipistrelles recorded on site and then Nathusius Pipistrelle recorded to the south of the site.

In addition two Schwegler 1WI Summer and Winter bat boxes will be integrated within the brick work of two of the new properties. This design of bat box has been designed for bat species that inhabit buildings, including Serotine bats. It is designed for all year occupation and can support maternity roosts (NHBS, 2015). These bat boxes will be introduced at the highest possible points along the western extent of the site.

5.1 Orientation

In general, bats seek warm spaces to help them with rearing young. For this reason, bat boxes should be located where they will receive at least partial sunlight (facing south, south-west or south-east). However, by installing bat boxes in more than one orientation will allow for a range of roosting conditions. To increase the chances of bats identifying the new features they will be placed adjacent to vegetation features such as hedges and tree lines. Bats are more likely to discover artificial roosts if they are placed close to an existing flight path (**Figure 6**).

Figure 6. Location of Bat Boxes (IBSTOCK in orange and 1WI in yellow).



positioned near the eaves or gable apex of the buildings to minimise disturbance.

Inline with Natural England guidance (2015) roofing felt should be utilised as apposed to Breathable Roof Membrane (BRM) as there is considerable evidence to suggest that BRM poses a threat to bats occupying loft voids due to entanglement of bats in the fibres (Natural England, 2015).

6.0 SUMMARY

This Mitigation Strategy will ensure that the commuting and foraging bats on site will not be negatively impacted by proposals. In addition it has highlighted lengths to increase the site's favorability to support foraging bats and potentially introduce roosting bats.

7.0 REFERENCES

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