



Land at Hulbert Road

Bat Activity Survey



**For Trustees of the GHM Jackson 1972
Settlement**

December 2019

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Executive Summary

Contents	Summary
Site Location	The site is located to between the A3 dual carriageway and the B2150 Hulbert Road approximately 0.4 km west of Havant and is centred at Ordnance Survey National Grid Reference: SU 69446 08144. The site is shown in Figure 1 and comprises a field of semi-improved grassland and an area of hardstanding that has a shallow ditch surrounding all sides. The site adjoins areas of broadleaved and mixed woodland to the north and south and scrub / trees to its east and west.
Proposals	The proposals currently include the construction of residential units with associated landscaping and access.
Existing Site Information	Previous trapping surveys of the site were undertaken in 2018 by Davidson Watts ecology. An Ecological Appraisal of the site was undertaken by WYG in 2019 (WYG 2019) which identified the site as having 'moderate' potential to be suitable for commuting and foraging bats..
Scope of this Survey(s)	The scope of this survey was to undertake bat surveys to gain an understanding of bat species' usage of the site, to make an assessment of the effects of the proposed development of the site relating to bat species and make recommendations for mitigation and enhancement where necessary and / or possible.
Results	Up to six different species of bat were recorded using the site. During the walked transect surveys low numbers of, common pipistrelle, soprano pipistrelle, serotine, noctule and myotis sp. were recorded. Common pipistrelle, soprano pipistrelle, serotine, Myotis sp., barbastelle, Natterer's and long-eared bat sp. were recorded during the automated surveys. During the harp trapping surveys one female brown long-eared bat was caught. During the surveys, bats were observed foraging and commuting mainly along the boundaries of the site.
Mitigation and enhancement	The following measures are recommended to mitigate effects on bats within the development site: • Lighting scheme; • Avoidance of use of MRM; • Tree and hedgerow retention / replacement; and • Landscaping design. Habitat enhancements, which would benefit foraging and commuting bats could include: • Trees lines along the northern, western and southern boundary of the application site could also be enhanced by using infill planting;



	• Planting of native species of value to foraging and commuting bats into landscape plan; and • The provision of ten bat boxes attached to suitable retained trees on site (Schwegler 1FR, 1F, 2FN and 1FF or similar).
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Glossary

BCT	Bat Conservation Trust
BRM	Breathable Roofing Membrane
CIEEM	Chartered Institute of Ecology & Environmental Management
HBIC	Hampshire Biodiversity Information Centre
HMSO	Her Majesty's Stationary Office
ILP	Institution of Lighting Professionals
LED	Light-emitting Diode
LPA	Local Planning Authority
MAGIC	Multi-Agency Geographic Information for the Countryside
NERC Act	Natural Environment and Rural Communities Act 2006
NPPF	National Planning Policy Framework
W&CA	Wildlife & Countryside Act 1981

1.0 Introduction

1.1 Background

WYG was commissioned in August 2019 to complete bat activity surveys to inform the proposed development at the land at Hulbert road, Havant (here after known as 'the site'). Bat surveys were recommended following the results of the Ecological Appraisal completed by WYG in 2019 (WYG 2019).

This report gives the finding of bat activity surveys completed between 5th August 2019 and the 22nd October 2019, and was prepared by WYG Consultant Ecologist Emma Taylor. The report conditions are given in Appendix A.

1.2 Site Location

The 'site' is located to between the A3 dual carriageway and the B2150 Hulbert Road approximately 0.4 km west of Havant and is centred at Ordnance Survey National Grid Reference: SU 69446 08144 – see Figure 1. It comprises a field of semi-improved grassland and an area hardstanding with a shallow ditch surrounding all sides. The site adjoins areas of broadleaved and mixed woodland to the north and south and scrub / trees to its east and west.

1.3 Development Proposals

The proposals currently include the construction of residential units with associated landscaping and access.

1.4 Purpose of the Report

The ecological investigations for bats undertaken by WYG included the following:

- Bat activity surveys to gain an understanding of bat species' usage of the Site and an indication of population numbers;
- Bat trapping surveys to establish the status of Bechstein's bat *Myotis Bechsteini* on the site; and
- An assessment of the effects of the proposed development of the site relating to bat species and recommendations for mitigation and enhancement where necessary and / or possible.

1.5 Previous Reports

1.5.1 Survey Data

In 2019 advanced bat surveys of the land to the were undertaken by Davidson-Watts Ecology (2018). The survey consisted of five harp trapping surveys using six traps within woodland along the northern and southern boundaries from the 16th June - 1st October 2018. The results of the survey are seen in Table 1.

Table 1: Bat trapping results 2018 (Davidson-Watts Ecology (2018))

Date	Species captured
16/06/2019	No captures
08/07/2019	4 – <i>Myotis mystacinus / brandtii</i>
	1 – Common pipistrelle <i>Pipistrellus pipistrellus</i>
31/09/2019	2- Brown long-eared <i>Plecotus auritus</i>
	1- <i>Myotis mystacinus / brandtii</i>
02/08/2019	No captures
01/09/2019	No captures

An Ecological Appraisal was undertaken in 2019 (WYG 2019) which recorded suitable foraging and commuting habitats for bats including; tall ruderal vegetation, semi -improved grassland, dense / scattered scrub and semi-natural mixed and broadleaved woodlands along the boundaries. The site was assessed as having **moderate suitability** for foraging and commuting bats.

Bat activity surveys in accordance with Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* (Collins, 2016) were recommended based on:

- The occurrence of the bat records in the local area, including 269 records of 11 different species and one granted EPS licence for bats within 2 km;
- The presence of suitable foraging and commuting habitat both within the site and in the surrounding landscape (semi-improved grassland, scrub, woodland etc.);
- Potential direct and indirect impacts to some of these habitats as a result of the development proposals; and
- To meet requirements of Havant Local Plan Policy E15 which defines a 'Bechstein's Bat Area' (Havant Local Plan 2036). The site falls within this area and therefore a bat trapping surveys were undertaken in an effort to establish the status of this species on the Site.

1.5.2 Local Ecological Records Centre

As part of Ecological Appraisal (WYG, 2019), information was requested from Hampshire Biological Records Centre (HBIC) on protected or notable species records within 2 km of the site.

HBIC returned 149 records of bats within 2 km of the site, comprising;

- Alcathe bat *Myotis alcathoe*;
- Bechstein's bat *Myotis bechsteinii*;
- Brandt's bat *Myotis brandtii*;
- Brown long-eared bat *Plecotus auritus*;
- Common pipistrelle *Pipistrellus pipistrellus*;
- Natterer's bat *Myotis nattereri*;
- Noctule *Nyctalus noctula*;
- Parti-coloured bat *Vespertilio murinus*.
- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Unidentified long-eared bat *Plecotus* sp.;
- Unidentified pipistrelle bat *Pipistrellus* sp; and



- Whiskered bat *Myotis mystacinus*.

The closest records was for a soprano pipistrelle, approximately 0.3 km north of the site.

A search of data using DEFRA's MAGIC website identified one bat licence granted in 2016 within 2 km radius of the site. The licence (Ref: EPSM2013-5591) was granted for the 'destruction of a resting place' used by common pipistrelles and brown long-eared bats.

2.0 Methodology

2.1 Walked Transect surveys

In accordance with guidance set out in the Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* (Collins, 2016) one survey visit per month was completed between June to October, , although due to time constraints two survey visits per month were completed between September to October 2019 rather than one per month between as it was not possible to complete surveys in June and July. One survey (October) consisted of a dusk survey followed by a dawn survey within one 24 hour period.

All surveys were completed when weather conditions were suitable (i.e. not during heavy rain, low temperatures or strong winds).

The activity surveys were completed using two surveyors, following a pre-determined transect route incorporating all accessible boundary features, on the following dates:

- 13th August 2019
- 5th September 2019
- 26th September 2019
- 27th September 2019
- 10th October 2019
- 22nd October 2019
- 8th April 2020
- 21st May 2020

The dusk / dawn transect was undertaken on the 26th and 27th of September.

Dusk surveys commenced at sunset and concluded two hours after sunset. The dawn survey commenced two hours before sunrise and concluded at sunrise. Weather conditions (temperature, precipitation and wind speed) were recorded at the start and end of each survey.

The surveyors noted bat activity, using both visual observation and audio bat detectors to identify foraging and / or commuting behaviour. Surveyors recorded the time and a description of any activity. Additionally, where bats could be seen, the patterns and directions of the bats' flight were also recorded.

Surveyors were all qualified ecologists and experienced at conducting bat surveys. All surveys were completed using an Elekon bat logger (full spectrum) and were walked along a set transect (wherever possible) at a steady pace. The direction in which the transect was walked was changed between surveys in order to record activity around the site at different times. The recorded data was analysed

using Bat Explorer to confirm the species' present onsite. The recordings and the field notes were used to help build a picture of bat use across the site and to identify areas of relatively higher use.

The transect route for each survey is shown in Figure 2.

2.2 Automated Activity surveys

In accordance with Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* (Collins, 2016), two automated bat detectors (Anabat Express) were deployed at two locations along the transect for five consecutive nights per month between August – October 2019 to record bat passes overall consecutive nights. This was analysed to gain further information on the species present and relative amount of activity through the night.

The location of the automated detectors is shown in Figure 2.

2.3 Harp Trapping Surveys

As reported in the Ecological Appraisal (WYG, 2019) suitable habitats that associated with Bechstein's bats were recorded on site or within the site boundaries in the form of semi-natural mixed woodland, semi-natural broadleaved woodland and scattered scrub. In order to comply with policy E18 of the Havant local plan (2036) "*for sites likely to contain Bechstein's bats planning permission will only be granted where, survey methods appropriate to Bechstein's bats are used and undertaken by qualified ecologists.*" A series of harp trapping surveys were undertaken to establish if Bechstein's and barbastelle bats were using the site.

Three trapping surveys were undertaken on 5th August, 22nd August and 10th September, using; one harp trap, one 9 m net and one 6 m net in combination with two acoustic bat lures (Apodemus BatLure.) used to increase the effectiveness of trapping.

The primary aim of these techniques is to determine the presence of quiet echolocating species, and to determine the species, sex and breeding status of bats using the site by being able to examine bats in the hand. The harp trapping was undertaken in line with the BCT Guidelines (Chapter 9) (Collins, 2016). Trapping surveys commenced at dusk and continued to approximately 19:00 – 02:00. The surveys were undertaken in weather conditions with temperatures above 9°C, avoiding strong winds and heavy, persistent rain.

Throughout all the surveys the trap locations were in the same location, as seen in Figure 2. Trap sites were actively selected to increase the chance of capturing bats, rather than being chosen at random. Therefore, habitats most likely to support foraging or commuting bats, and in particular Bechstein's, woodlands to the north and south of the site.

All bats caught were identified to species level, sexed, aged and breeding status was determined e.g. breeding female, non-breeding female, sexually active male etc. Bats were released immediately following examination.

2.4 Valuing Bat Populations in a Wider Ecological Context

The assessment of the value of the bat population on site was based on the method proposed by Wray *et al.* (2010). Using this method bat activity, species and number was used to assign a relative ecological value. The value to the species was partly based upon how well used a habitat is and also upon how rare the bat species is. In the case of commuting routes or foraging areas the number of roosts nearby is also a factor. Once the value of the bat population was calculated, robust mitigation for any impact on the bats was determined.

British bat species have been subdivided into groups, dependant on how common they are: common, rarer and rarest. These have been further subdivided based upon the location surveyed. Table 2 presents the rarity categorisation of bats in England (after Wray *et al.*, 2010).

Table 2: Categorising bats by distribution and rarity in England

Country: England		
Rarest	Rarer	Common
Greater horseshoe Bechstein's Alcathoe Greater mouse-eared Barbastelle Grey long-eared	Lesser horseshoe Whiskered Brandt's Daubenton's Natterer's Leisler's Noctule Nathusius' pipistrelle Serotine	Common pipistrelle Soprano pipistrelle Brown long-eared

To calculate the score for either commuting routes or foraging areas the numerical values from each column below are added together. These are detailed in Table 3 and 4.

Table 3: Valuing commuting routes

Species	Number of bats	Roosts/potential roosts nearby	Type and complexity of linear features
Common (2)	Individual bats (5)	None (1)	Absence of (other) linear features (1)
-	-	Small number (3)	Unvegetated fences and large field sizes (2)
Rarer (5)	Small number of bats (10)	Moderate number/Not known (4)	Walls, gappy or flailed hedgerows, isolated well grown hedgerows, and moderate field sizes (3)
-	-	Large number of roosts or close to a Site of Special Scientific Interest (SSSI) (5)	Well grown and well connected hedgerows, small field sizes (4)
Rarest (20)	Large number of bats (20)	Close to or within a Special Area of Conservation (SAC) for the species (20)	Complex network of mature well-established hedgerows, small fields and rivers/streams (5)

Table 4: Valuing foraging areas

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

Finally, for commuting routes and foraging areas, the ecological value of the site is based upon the scoring system shown in Table 5.

Table 5: Scoring system for valuing commuting and foraging bats

Geographic frame of reference	Score
International	>50
National	41-50
Regional	31-40
County	21-30
District, local or parish	11-20
Not important	1-10

3.0 Legislation

All British bat species are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (HMSO, 1981) and under Schedule 2 of the Conservation of Habitats and Species Regulations 2017 as European protected species (HMSO, 2017). Furthermore, the Countryside and Rights of Way Act 2000 (Schedule 12, Paragraph 5) (HMSO, 2000) has amended Section 9 of the 1981 Act. They are, therefore, fully protected under Section 9 of the 1981 Act and under Regulation 41 of the Conservation of Habitats and Species Regulations 2017 which transposes the Habitats Directive into UK law.

This makes it an offence to:

- Deliberately capture, injure or kill any bat;
- Deliberately disturb bats, in particular where it is likely to:
 - Impair their ability to breed or reproduce, or to rear or nurture their young;
 - Impair their ability to hibernate or migrate; or
 - Affect significantly the local distribution or abundance of bats.

- Intentionally or recklessly damage, destroy or obstruct the access to the place of shelter or protection; and
- Damage or destroy a bats breeding site or resting place.

4.0 Results

4.1 Survey Timings and Weather Conditions

Table 6 summarises the dates, timings and weather conditions for each survey.

Table 6: Weather conditions during activity transect surveys

Survey No.	Date	Dusk / Dawn Times	Survey Timings	Weather Conditions	
				Start	End
1	13/08/2019	20:29	20:29-11:29	16.0°C; 100% cloud cover; wind speed 0; nil precipitation.	16.0°C; 100% cloud cover; wind speed 0; nil precipitation.
2	05/09/2019	19:41	19:41-22:41	15.4°C; 10% cloud cover; wind speed 1; nil precipitation.	10°C; 0% cloud cover; wind speed 1; nil precipitation.
3	26/09/2019	18:54	18:54-21:54	16.1°C; 60% cloud cover; wind speed 2; nil precipitation.	14.9°C; 10% cloud cover; wind speed 2; nil precipitation.
4	27/09/2019	06:57	03:57-06:57	13.6°C; 90% cloud cover; wind speed 1; nil precipitation.	12.8°C; 60% cloud cover; wind speed 1; nil precipitation.
5	10/10/2019	19:30	19:30-21:30	15°C; 45% cloud cover; wind speed 1; nil precipitation.	12.°C; 45% cloud cover; wind speed 1; nil precipitation.
6	22/10/2019	17:58	17:58-20:58	9°C; 0% cloud cover; wind speed 0; nil precipitation.	8°C; 0% cloud cover; wind speed 0; nil precipitation.
7	08/04/2020	19:49	22:49	14.2; 0% cloud cover; wind speed 1; nil precipitation.	11.20;% cloud cover; wind speed 0; nil precipitation.
8	21/5/2020	20.54	20.54-23.54	15°C; 30% cloud cover; wind speed 0; nil precipitation.	1.4°C; 30% cloud cover; wind speed 1; nil precipitation.

4.2 Walked Transect Survey Results

At least five different bats species were recorded during the walked transect surveys. Recordings were dominated by common pipistrelles, soprano pipistrelles, serotine and noctules with occasional *Myotis* sp. also recorded (although none of these could be attributed to Bechstein's bat). Activity levels were during all survey were low with a small number of individuals were likely to be involved.

During the surveys bats were observed foraging and commuting along the wooded site boundaries. Fewer bats were recorded on the eastern boundary.

Figure 3 shows the bat activity across the site during the surveys.

4.3 Automated Detector Survey

The automated detectors deployed on site recorded at least eight species of bat using commuting and foraging across the site although the number of recordings was low. Passes were dominated by common pipistrelle, soprano pipistrelle and myotis species (although none of these could positively identified as belonging to Bechstein's bats. A single barbastelle *Barbastella barbastellus* bat was recorded on the 15th September on the automated detector located in the south eastern corner of the site.

Detailed results of the automated activity surveys are shown in Appendix B.

4.4 Harp Trapping results

Table 7 summarises the dates, timings and weather conditions for each survey.

Table 7: Weather conditions for harp trapping surveys

Survey No.	Date	Dusk / Dawn Times	Survey Timings	Weather Conditions	
				Start	End
1	05/08/2019	20:44	19:15-01:00	17.7°C; 0% cloud cover; wind speed 1-2; nil precipitation	17.4°C; 40% cloud cover; wind speed 1; nil precipitation
2	22/08/2019	20:12	19:00-02:00	17°C; 0% cloud cover; wind speed 1; nil precipitation	12.3°C; 0% cloud cover; wind speed 1; nil precipitation
3	10/09/2019	19:30	18:15-23:30	15.6°C; 100% cloud cover; wind speed 0; nil precipitation	13.1°C; 100% cloud cover; wind speed 0; nil precipitation

One non-breeding female brown long-eared bat was caught during the survey on the 22nd August, shown in Photograph 1, with further details in Table 8. No other bats were caught during the surveys.

Photograph 1: Female brown long-eared bat**Table 8: The results of the harp trapping surveys**

Species	Bats captured	Location
Brown long-eared	Female none breeding, forearm 40mm, weight 10 g	Woodland to the north of the site.

4.5 Survey Limitations

Surveys were not be undertaken in June or July. To compensate for this the survey effort was doubled within the survey period from September-October with two activity surveys undertaken per month. In addition the surveys were undertaken for a period of three hours after sunset in order to maximise the potential of reordering any rarer bats in the vicinity. The bat activity was broadly similar during the activity surveys so it is not considered that this is a limitation on the surveys overall.

No bats were also recorded on the automated detectors in the south eastern corner between the 01/09/2019 -05/09/2019, this is due to the failure of the detector, therefore it was not possible to know what bats activity was present in the vicinity of the detector during this period. Due to the generally low levels of activity recorded by the static detectors this is not considered a limitation overall.

The details of this report will remain valid for a period of **two years** from the date of the survey, after which the validity of this assessment should be reviewed to determine whether further updates are necessary. Note that the recommendations within this report should be reviewed (and reassessed if necessary) should there be any changes to the red line boundary or development proposals which this report was based on.

5.0 Potential Impact of the Development on Bats

5.1 Valuation of Bat Population using the Site

The site was found to be of value at a **Regional Level** for foraging and commuting bats based on the Wray *et al.* (2010) method.

This assessment is based on the following valuations:

Commuting routes

- A commuting route of rarer species comprising small numbers of bats with an unknown number of roosts nearby in a landscape of well grown and Complex network of mature well-established hedgerows, small fields and rivers/streams scored $20 + 5 + 4 + 4 = 33$, indicating a commuting route of **Regional Level**.

Foraging areas

- Small numbers of the rarest species foraging in an area with an unknown number of roosts nearby within a complex habitat network of mature well-established hedgerows, small fields and rivers/streams $20 + 5 + 4 + 4 = 33$, indicating a foraging area of **Regional Level**.

This method possibly over values the site, although rare species (barbastelles were) recorded on the automated detector, they were individual bats on a one off occasion. No rare species of bats were recorded during the walked transect survey or the harp trapping survey. The potential impact of traffic noise from the adjacent A3 is likely to limit the value of the site for foraging bats,

5.2 Impacts on Foraging and Commuting Habitat

Development of the site may involve the partial removal and / or disturbance of grassland, scrub and woodland edge trees within the site.

There is also the potential for bats to forage and commute within areas of retained habitat which may be impacted by lighting during the construction and operational phases of development. Lighting can illuminate bats in flight and make them more vulnerable to being predated.

Recommendations to mitigate the potential development impacts are provided in the following section.

6.0 Mitigation and Enhancement Measures

6.1 Mitigation Measures

The following measures are recommended to help mitigate for the predicted impacts of the development proposals:

- Lighting scheme;
- Avoidance of use of Modern Roofing Membranes (MRM);
- Woodland, tree and hedgerow retention / replacement; and



- Landscaping design.

6.1.1 Lighting Scheme

The Institution of Lighting Professionals (ILP) states that the impacts from artificial lighting on bats are likely to have significant impacts on some species, potentially affecting reproductive, foraging and roosting opportunities (ILP, 2018).

The results of the survey suggest the habitats along the site boundaries consisting of dense scrub, line of ash trees, semi natural mixed woodland are important commuting corridors for bats. In these areas a lighting scheme is required in accordance with the Havant Local Plan Havant 2036):

"If it is not possible to avoid an impact on areas used by Bechstein's bat for foraging and movement, mitigation measures should be used. This could include buffering, maintenance of flight corridors, and sensitive lighting."

The following light scheme is recommended within the development;

- No lighting on the back of the residential dwellings that illuminates the buffer zone between the dwelling and the boundary habitats to protect flight lines;
- LED lamps, with a low colour correlated temperature – preferably below 3500K (warm white) to be used along the pedestrian walk way, lighting to be placed on the side the dwellings;
- Low level lighting to be placed at the entrance of the site, with a rear shield on lamps adjacent to the woodland and line of trees; and
- LED lamps, with a low colour correlated temperature – preferably below 3500K warm white to be placed on the opposite side of the road to the new tree planting landscape link.

All lighting across the site should be directed groundward to avoid light spillage, with hoods / shields as necessary. Light spill on boundary features to be used by commuting bats should be a maximum of 1lux above existing levels. No external lighting will be directed at the retained vegetated boundaries

6.1.2 Modern Roofing Membranes

Within the residential dwelling proposed for the site, it is recommended that Type 1F bitumen and hessian under-felt should be used.

Research by Waring *et al.* (2013) found that many roofing membranes pose a risk to bats. This was due to bats becoming trapped in loose fibres that are freed as membranes degrade and by the action of bats using them for roosting. Trapped bats are then unable to escape and will dehydrate and starve to death. As well as posing a risk to bats, many roofing membranes were also found to be damaged by bats, impairing their efficiency.

In research by Waring *et al.* (2013), these membranes were referred to as Breathable Roofing Membranes (BRM). Since this research was published, several other membrane types are available on the market. In the latest advice from the BCT (Collins, 2019), the terminology has therefore been changed to MRM so that all potentially hazardous materials are included. However, the guidance is unchanged, and the use of MRM should be avoided. Instead, it is recommended that Type 1F bitumen and hessian under-felt should be considered as an alternative.



6.1.3 Woodland, Tree and Hedgerow Retention / Replacement

In the proposed plans for the site, the semi -natural woodland and mixed semi natural woodland that are present along the site boundaries are being retained, with tree planting throughout the site providing a landscape link to the woodland. The tree planting should consist of species including; oak *Quercus robur*, ash *Fraxinus excelsior* and beech *Fagus sylvatica* as these are preferred species for tree roosting bats such as Bechstein's and barbastelle bats.

6.1.4 Landscaping Design

The proposed plan for the site, involves a boundary buffer distancing residential development from the boundary habitats. The areas of grassland, should comprise of a wild flower mix that includes evening scented plants, to enhance the site for wildlife to compensate for the loss of semi improved grassland. This is aesthetically pleasing to the eye and enhances the allocated grass areas for a range species including bats, reptiles and invertebrates.

Planting along the western boundary consisting of mixed scrub and trees, to compensate for the loss of areas of dense scrub, should consist of native species including; blackthorn *Prunus spinosa*, bramble *Rubus fruticosus*, gorse *Ulex europaeus* and hawthorn *Crataegus monogyna*.

The high quality landscaping in the courtyard areas, should incorporate a structurally diverse range of plant that in inclusion of native evening-blooming plants. This will attract insects which in turn will help to enhance the site for foraging bats to compensate for the loss of scattered scrub and semi improved neutral grassland. Evening blossoming plants recommended are:

- Bladder campion *Silene vulgaris*;
- Evening primrose *Oenothera biennis*;
- Fleabane *Pulicaria dysenterica*;
- Soapwort *Saponaria officinalis* ; and
- Red valerian *Centranthus ruber* .

Tree planting across the site within the parking areas should include a range of native species including; oak, beech and birch. These are the preferred trees of tree roosting bats along with providing a food source all year round for other species on site, including dormice, reptiles and invertebrates.

6.2 Enhancement Measures

Whilst enhancement is not a legal requirement, it is encouraged on site as it helps to meet the government objectives for planning to protect and enhance biodiversity, in accordance with the National Planning and Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2019).

6.2.1 Habitats

The creation of novel habitats within the residential areas should also be considered within the site to encourage foraging by a diverse range of bat species, with areas of meadow grassland, ornamental planting with the inclusion of evening scented flowers also considered viable and useful for foraging bats. Retained, existing woodland and trees lines along the northern, eastern and southern boundary of the application Site could also be enhanced by using infill planting of native species improving the



understorey. As detailed above, new planting should comprise native species. These habitat enhancements will provide additional foraging and commuting habitat for bats throughout the Site, planting of Oaks, beech and ash trees across the site are beneficial to tree roosting bats such as Bechstein's and barbastelles.

6.2.2 Bat Boxes

It is recommended that additional measures to enhance the Site for bats include the provision of 10 bat boxes attached to suitable retained trees within the woodland along the northern and southern boundaries. The recommended boxes are Schwegler 1F and 2FN or similar. These boxes should be placed in both sections of woodland on site.

7.0 Summary

The woodland edges, line of trees and scattered scrub along the site boundaries are used as foraging / commuting routes for up to 5 species of bats. The site was found to be at **Regional Level** for foraging and commuting bats based on the Wray *et al.* (2010) method, although a barbastelle bat was recorded on only one occasion and although *Myotis* species were recorded no positive identification of Bechstein's bat was made. In general bat activity of the site was found to be low considering the habitats present.

The development proposals for the site include a buffer zone between the development and the boundary habitats, tree planting throughout the site creating a linkage between the woodland along the northern and southern boundary. The tree line along the eastern boundary is to be maintained, and scrub / tree planting along the western boundary. Development of the site would result in the loss of foraging / commuting habitat for bats, and associated disturbance due to increased lighting. To mitigate for these impacts:

- A sensitive lighting scheme should be designed;
- Trees lines along the northern, western and southern boundary of the application site could also be enhanced by using infill planting; and
- Landscaping design should include native species which will benefit bats and maintain habitat connectivity.

Further enhancement measures will benefit the bat species using the site and help to meet the government objectives for planning to protect and enhance biodiversity should also be included within the design of the development proposals. With the implementation of mitigation and enhancement measures described within this report the site will continue to retain it's potential to support the existing assemblage of bats and no significant impacts on bats are likely.

8.0 References

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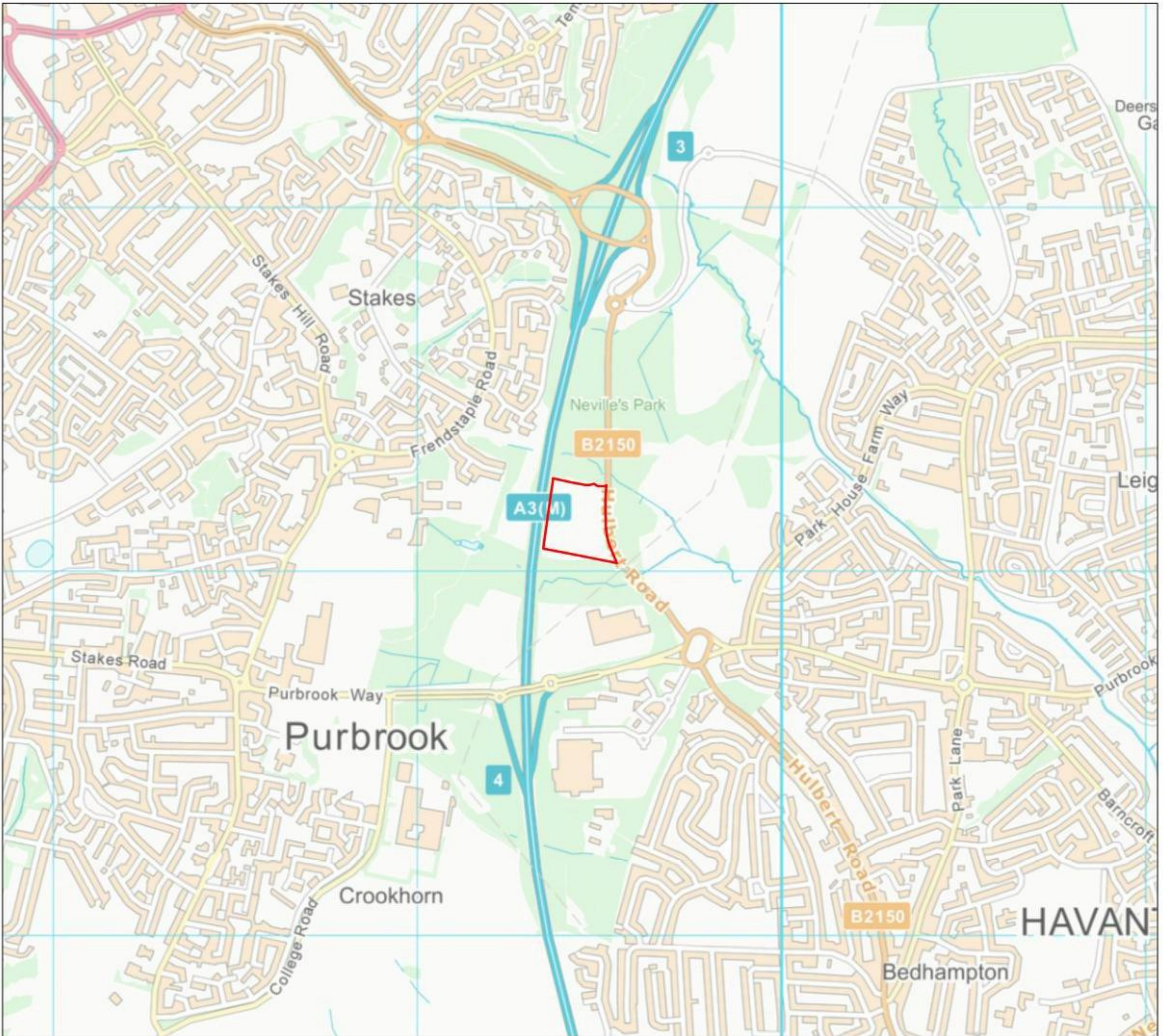


FIGURES

Figure 1 – Site Location Plan

Figure 2 – Transect Route and Static Detector Location

Figure 3 – Bat Activity Heat Map



Rev	Date	Notes
A	24/09/19	Initial map production

Legend

Site boundary

0 50 100 200 Metres



Site Location Plan

Hulbert Rd, Havant
Trustees of the GHM Jackson
1972 Settlement

Scale at A3: 1:10,000	Project No: A096474	Drawing No: Figure 1	Revision: A
Drawn by: Maddie Errington	Drawn date: 24/09/2019	Approved by: John Simper	

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Appendix A – Report Conditions



REPORT CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of the Trustees of the GHM Jackson 1972 Settlement ("the Client") for the proposed uses stated in the report by WYG Environment Planning Transport Limited ("WYG"). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

No liability is accepted or warranty given for; unconfirmed data, third party documents and information supplied to WYG or for the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report. WYG does not purport to provide specialist legal, tax or accounting advice.

The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The "shelf life" of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.



Appendix B – Automated Activity Survey Results

Automated Bat Detector Survey Results from August 2019 (NW corner)

Date	Species	Number of Passes
23/08/2019	Serotine	1
23/08/2019	Common pipistrelle	6
23/08/2019	Soprano Pipistrelle	2
24/08/2019	Myotis sp.	16
24/08/2019	Pipistrelle	1
24/08/2019	Soprano pipistrelle	6
25/08/2019	Myotis sp.	5
25/08/2019	Common pipistrelle	13
26/08/2019	Myotis sp.	7
26/08/2019	Soprano pipistrelle	6
27/08/2019	Myotis sp.	1
27/08/2019	Soprano pipistrelle	4
27/08/2019	Pipistrelle	1
28/09/2019	Serotine	1
29/08/2019	Serotine	2
29/08/2019	Myotis sp.	6
29/08/2019	Soprano pipistrelle	2

Automated Bat Detector Survey Results for August (SE corner)

Date	Species	Number of Passes
15/08/2019	Common pipistrelle	1
18/08/2019	Common pipistrelle	12
20/08/2019	Common pipistrelle	7
25/08/2019	Plecotus sp.	1
26/08/2019	Myotis sp.	1
27/08/2019	Serotine	1
28/08/2019	Serotine	1
28/08/2019	Myotis sp.	1
31/08/2019	Serotine	1



Date	Species	Number of Passes
31/08/2019	Common pipistrelle	1

- Nothing was recorded in the

Automated Bat Detector Survey Results from September 2019 (NW corner)

Date	Species	Number of Passes
01/09/2019	Myotis sp.	1
01/09/2019	Soprano pipistrelle	7
02/09/2019	Serotine	1
02/09/2019	Myotis sp.	4
02/09/2019	Common pipistrelle	1
02/09/2019	Soprano pipistrelle	2
03/09/2019	Serotine	1
03/09/2019	Myotis sp.	5
03/09/2019	Common pipistrelle	1
04/09/2019	Common pipistrelle	1
05/09/2019	Myotis sp.	1
05/09/2019	Common pipistrelle	8

No bats were recorded on the statics located in the south eastern corner between the 01/09/2019 - 05/09/2019.

No bats were recorded on the statics located in the north western corner and in the south eastern corner between the 23/09/2019 and the 28/09/2019.

Automated Bat Detector Survey Results from October 2019 (NW corner)

Date	Species	Number of Passes
09/10/2019	Myotis sp.	2
10/09/2019	Myotis sp.	1
10/09/2019	Common pipistrelle	1
11/09/2019	Myotis sp.	2
13/10/2019	Myotis sp.	4
13/10/2019	Pipistrelle	2
13/10/2019	Pipistrelle sp.	1
14/10/2019	Myotis sp.	5
14/10/2019	Myotis sp.	1
15/10/2019	Common pipistrelle	1
15/10/2019	Myotis sp.	3



Date	Species	Number of Passes
16/10/2019	Noctule	1
16/10/2019	Common pipistrelle	2
18/10/2019	Myotis sp.	5
19/10/2019	Serotine	2
19/10/2019	Pipistrelle	3
19/10/2019	Pipistrelle sp.	1

Automated Bat Detector Survey Results from October 2019 (SE corner)

Date	Species	Number of Passes
09/10/2019	Serotine	3
09/10/2019	Myotis sp.	12
09/10/2019	Serotine	1
10/09/2019	Myotis sp.	1
10/09/2019	Common pipistrelle	9
10/09/2019	Serotine	1
13/10/2019	Myotis sp.	16
13/10/2019	Noctule	1
13/10/2019	Pipistrelle	5
13/10/2019	Myotis sp.	3
13/10/2019	Pipistrelle	5
14/10/2019	Barbastelle	1
14/10/2019	Myotis sp.	5
15/10/2019	Common pipistrelle	5



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