ANDREW McCARTHY ECOLOGY

Land off East Street, Hindon Results of 2015 and 2018 Bat Surveys

Appendix 8 - Base Evidence

21 August 2019

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CG FRY & SON DEVELOPMENT

NON TECHNNICAL SUMMARY

This report presents the findings of bat surveys undertaken in 2015 and 2018 on a proposed residential development site adjacent to East Street in Hindon, Wiltshire. The Site comprises an arable field bounded by fences, hedges and trees.

Optimal nearby bat habitat appears minimal since the local area is dominated by arable, however there are extensive areas of woodland further south and north (the latter being associated with the 'Great Ridge') as well as a large lake at Fonthill Gifford, some 850m south-east. The site is ecologically linked to these potentially valuable bat habitats *via* hedges and tree lines.

The Site is 6.3km from the Chilmark Special Area of Conservation (SAC) which is designated for its bat interest - in particular for hibernating greater and lesser horseshoe, barbastelle and Bechstein's bats. Fonthill Grottoes SSSI lies 2.3km to the south-east; this is a hibernacula for seven bat species including greater horseshoe and occasionally Bechstein's and barbastelle. There is an obligation on planning authorities as 'competent authorities' to ensure developments do not have an adverse impact upon a SAC; either individually or in combination with other plans or projects. Case law is clear that there must be no reasonable scientific doubt regarding an absence of negative effects and in order for this to be the case, there must be sufficient ecological data upon which to base an impact assessment. Accordingly, bat surveys were undertaken during 2015 with update surveys being undertaken during April to September 2018, following consultation with the Wiltshire Senior Ecologist Louisa Kilgallen.

Other than the widespread and relatively common bats such as pipistrelles being present, both surveys recorded good numbers of the rare barbastelle bats using the north-western and north-eastern boundaries, as well as occasional greater and lesser horseshoe bats. As these species are all 'qualifying features' of the SAC, so being able to maintain ecological functionality along the north-west and eastern site margins has been identified as central to ensuring that a residential development here would not have a significant effect upon the integrity of the SAC. Impacts with potential to affect the SAC include (i) loss, damage or change to management of potential foraging habitat (ii) removal, fragmentation and modification of habitat along potential commuting corridors - including the potentially disruptive effects of artificial lighting. In view of the habitat requirements of the 'qualifying' species (which include a need for dark sheltered corridors at a landscape scale) the final section of the report discusses a range of potential mitigation options, including broad, unlit boundaries along the north-western and north-eastern edges.

It is anticipated that what are at present outline proposals will be refined as the scheme design progresses; the survey data presented here will eventually form the basis for an ecological impact assessment and will underpin an Information for Habitats Regulations Assessment report should this be needed.

CONTENTS

1.0 INTRODUCTION

1.1 Background

This report presents the results of bat surveys at a site adjacent to East Street, Hindon, Wiltshire (hereafter referred to as the Site), which is centred on ordnance survey grid reference ST910329. A location plan is provided as Figure 8.1 in the appendix at the rear of this document.

1.2 Summary description

The Site lies in an urban / rural edge setting with the small settlement of Hindon being immediately adjacent to the south-west. The red line (Figure 8.2 Appendix) encloses a broadly triangular arable field bounded by deciduous hedgerows with occasional immature trees along its north-western edge, and a hedge dominated by dense bramble scrub along the north-eastern boundary. A small hedge with a narrow lane beyond bounds the southern edge, whilst the western boundary comprises an open grassy bank and a post-and-wire fence (beyond which lies East Street and a series of residential dwellings). The western corner comprises a small square parcel of land that was under an Environmental Stewardship scheme for farmland birds when the bat surveys commenced in 2015[1]. This area is bounded by mature trees and domestic gardens to the west. Woodlands and a lake associated with Fonthill Gifford lie around 850m south-east, and large areas of woodland associated with the 'Great Ridge' lie around 2km north. The site is ecologically linked to these landscape-scale features by treelines and hedgerows.

The site lies some 6.3km from the internationally important Chilmark Quarries Special Area of Conservation (SAC) which is designated for its bat interest; in particular for hibernating greater and lesser horseshoe, barbastelle and Bechstein's bats. Fonthill Grottoes SSSI lies 2.3km south-east. This is a hibernacula for seven bat species including greater horseshoe and occasionally Bechstein's and barbastelle. Special Areas of Conservation (SACs) are strictly protected sites designated under the EU Habitats Directive for internationally important habitats and species; in this case the special interest is for four nationally rare bats species which are listed on Annex 2 to the Directive. As a consequence of the proximity of the proposed development site to the SAC (the Site sits within the foraging range for several key species for which this SAC is designated) it is necessary to provide detailed information on bats to inform the emerging design and to help plan a robust mitigation scheme.

1.3 Scheme Specification

The proposed development is for a residential scheme, together with associated services and infrastructure. The design is still at an early stage so no masterplan has yet been compiled and the scheme shown in Figure 1 below is a sketch only; it will be

[1] This is still the case, so far as is known.

subject to change following further consultation and baseline survey from various technical disciplines and it is expected that the outcome of the ecology consultation (together with the data presented in this report) will help guide the final scheme design.

This report is expected to eventually underpin an Ecological Impact Assessment (EcIA) and IfHRA (Information for Habitats Regulations Assessment) reports, once the scheme has progressed sufficiently to enable impacts and mitigation measures to be determined precisely.

Figure 1. Sketch scheme layout as of summer 2018 (to be refined following further consultation)

1.4 Objectives

The aim of this report is as follows:

- To identify habitats within the site that support commuting or foraging bats and to evaluate the sites' importance in this respect;
- To assess the potential impact of a development in this location on the species for which the SAC is designated;
- To help guide the developing scheme design and to enable appropriate mitigation measures to be incorporated that will ensure no Likely Significant Effect upon the SAC.

2.0 SURVEY METHODOLOGY

2.1 Desk Study

At the outset of the project a standard species and sites' data search was carried out through Wiltshire and Swindon Biological Records Centre (WSBRC) within an area of 2 km radius, as well as a search of relevant European sites within an area of 10 km. This included provision of a map showing location of statutory and local sites, and protected UK & Wiltshire BAP / other notable species records held digitally (see AME, 2014). Bat records and relevant designated sites were extracted from these data for this species-specific assessment. The desk study will need to be revised at some point; it is suggested that this is completed prior to preparing EcIA / IfHRA reports, as these are likely to be required as part of a planning submission.

2.2 Bat Activity Surveys

2.2.1 Bat activity 2015

The first tranche of bat surveys were undertaken in 2015, prior to release of the current best practice document (in 2016); thus the surveys were based upon guidance in Hundt (2012). This recommended three activity transect surveys as appropriate for habitat of what at the time was considered to be probably low to moderate quality for foraging / commuting bats. Three sessions were originally planned; commencing in May and continuing through into July and August 2015. Following discovery of unexpected numbers of barbastelle bats and after liaising with the Wiltshire ecologist, it was decided to add two further transect sessions in September and October, to help determine whether bats were moving though the site in significant numbers to Chilmark for autumnal swarming and mating / hibernation (Parsons, Davidson-Watts, Greenaway and Jones 2003).

The 2015 (and 2018) transect route is shown on Figure 8.2 in the appendix as a Batlogger track; it was walked by two surveyors both of whom used full spectrum Elekon Batlogger M units; these units use an FG microphone with a sampling rate of 312.5 kHz which is more than sufficient to detect the high-frequency echolocating bat species such as lesser horseshoe bats *Rhinolophus hipposideros*. When a bat flew within range of a detector microphone its ultrasound was automatically recorded to SD card with a time and date stamp. In addition GPS mode was enabled on the detectors and all calls were georeferenced with a GPS coordinate.

Transect surveys in May, July and August 2015 commenced 15 minutes before sunset and finished 2.5 hours after sunset. Transect sessions in September and October commenced 1-2 hours after dusk and continued for three hours (since research has shown that bats travel to swarming sites after bouts of foraging and thus make these landscape-scale movements well after dusk) (Parsons, Davidson-Watts, Greenaway and Jones, 2003).

The locations of all recordings were mapped with google maps using BatExplorer software. Calls were analysed and call locations used to produce species 'dot maps'.

2.2.2 Bat activity 2018

Survey methodology in 2018 was the same as in 2015, with the exception of the number of sessions; six in total being undertaken - i.e. one per month around one apart during April, May, June, July, August and September. This was agreed as acceptable for an update survey with Louisa Kilgallen, Senior Ecologist at Wiltshire Council. The same equipment (Bat Logger M) was used in 2018 as in 2015 along the same transect route was walked. The transect session in September 2018 also commenced 1 hour after dusk and continued for three hours for the reasons stated above.

2.3 Static Loggers

2.3.1 Static loggers 2015

A single static bat call logger was deployed in suitable bat foraging / commuting habitat at the end of each activity period in May, July and August. An additional logger (making two in total per month) was deployed in September and October 2015 as a result of high number of barbastelle calls being logged. Loggers were set to record for over five night periods. An Elekon Batlogger M with extendable microphone and external battery were used for each of the 2015 surveys. Figure 8.5 gives logger locations for the 2015 survey periods.

2.3.2 Static loggers 2018

Two Anabat Express static loggers were deployed in suitable bat foraging / commuting habitat along the north-western and north-eastern margins during suitable weather in May, July and September for five night periods (see 8.5 inset for logger locations for 2018). Anabat Express units use an omnidirectional microphone with a sensitivity sufficient to readily detect frequencies emitted by the target bat species. Loggers were positioned in order to detect bats commuting along linear features that have been identified previously as being valuable for the target species.

2.4 Trapping Survey 2015

To compliment the transect and logger surveys in 2015, two bat trapping surveys were undertaken in September and October using two $4m^2$ harp traps, in combination with Sussex Autobat acoustic bat lures to increase trapping effectiveness. The harp trapping was undertaken to determine the presence of species with quiet echolocation calls (in particular Bechstein's bats) and to help to refine survey data in respect of species, sex and breeding status of these and other species using the site. Trapping locations are shown in Figure 8.6. Trapped bats were identified to species level, then sexed, aged and their breeding status determined - for example breeding female, non-breeding female, sexually active male etc.

2.5 Bat Call Analysis

2.5.1 Call analysis 2015

Discrete bat calls (referred to as bat passes) from both transect and logger surveys were recorded in full spectrum format. This retains all the information associated with a bat call recording (i.e. recordings are not compressed or converted). A bat pass is created when an echolocation call is detected by the logger; the sound information is then automatically recorded as a three second wav file. Recordings continue to be created whenever bat ultrasound is detected, effectively providing an index of bat activity. Recordings were analysed with a range of call analysis software including BatExplorer for Elekon equipment and where necessary 'Batsound' software from Pettersson AB for analysis of difficult calls. Passes were assigned to a species / species group depending on call characteristics based on Russ (2012) and from Ian Davidson-Watts own library of confirmed bat species calls. Generally, certain species can be reliably identified (such as pipistrelle bats, barbastelle and horseshoe bats) however *Myotis* and *Nyctalus/Eptesicus* species have been grouped together due to their overlapping call parameters.

2.5.2 Call analysis 2018

As in 2015, bat passes from the three transect sessions were recorded in full spectrum format using BatExplorer; these were analysed as in 2015 by Andrew Swan and Andrew McCarthy, both experienced bat ecologists.

Static logger calls were analysed by Andrew Swan using AnalookW (v4.1t) to confirm species identification, with each pass being assigned to a species (or species group) depending on its characteristics, based on Russ (2012) and in some cases via reference to a library of confirmed calls. The total number of bat passes from each species was logged in an Excel spreadsheet and the results then summarised for presentation and further analysis.

2.6 Qualifications and experience

The 2015 bat survey was designed and undertaken by Dr Ian Davidson-Watts, an appropriately licensed ecologist (licence registration numbers 2015-12287-CLS-CLS - CL19 Bat Survey Level 3) and 2015-12289-CLS-CLS - CL20 Bat Survey Level 4). Dr Davidson-Watts has over 20 years' experience undertaking bat surveys and holds a research degree in bat ecology.

The 2018 bat surveys were undertaken by Brady Roberts, a licensed bat ecologist (Level II licence number 2015-12287-CLS-CLS) with substantial experience working in Wiltshire with the target species.

The 2018 static logger data analysis was undertaken by Andrew Swan, holder of a Class 2 licence (ref: 2018-35890-CLS-CLS).

2.7 Survey limitations

Weather conditions during May 2015 were just within limits for a bat activity survey in open habitats; all other survey sessions were undertaken during optimal weather conditions. Despite the low number of bats recorded in May 2015, a sufficient and robust dataset on bat activity for this month was deemed to be obtained through a combination of transect and logger survey (Ian Davidson-Watts personal communication).

Due to the very open nature of habitats on the Site, harp trapping survey locations were limited and results do not therefore reflect the range of species recorded using other methods. It has not been possible for some species (such as barbastelle) to be able to determine sex / breeding status of individuals using the site, since these bats were not captured during trapping sessions.

Weather conditions were within limits during all 2018 field sessions and there were no limitations to completion of a robust update survey.

2.8 Ecological Evaluation

Ecological features and resources have been subject to evaluation based on the approach described in CIEEM (2016) where the value of an ecological feature or resource is determined with reference to a defined geographical context using the following criteria:

- International;
- National (England);
- Regional (South-west);
- County (or Metropolitan) (Wiltshire);
- District (or Unitary Authority, City or Borough) (Salisbury);
- Local (or Parish) (Hindon); and
- Site (at the site level only).

2.9 Provisional Impact Assessment

2.9.1 Assessment Methodology

CIEEM (2016) methodology has been followed in what is at this stage a very preliminary assessment of impacts. Any impact has been assessed within its relevant frame of geographical reference in terms of the levels of "international, national, regional, county (or metropolitan), district (or unitary authority, city of borough), local (or parish) or at the site level". Against this reference frame, impact magnitude can be (provisionally) assessed and categorised either quantitatively or under the following headings:

Table 2.1: Determination of impact magnitude

Magnitude	Determination of magnitude
Major	The magnitude of an impact is determined by taking into account the geographic frame of reference and the effect on the integrity of a site / habitat or the conservation status of a species in terms of the duration (permanent or temporary), reversibility, extent, timing, frequency and certainty (e.g. certain, probable or unlikely) of a potential impact. Impacts can be positive, neutral or negative in nature. For the purposes of this assessment *Major* and *Moderate* impacts are considered 'significant' (IEEM 2006).
Moderate	
Minor	
Negligible	

Impact magnitude is normally used in conjunction with a species conservation status nationally and locally to determine whether an impact is likely to be ecologically significant. Conservation status is defined in line with the EU Habitats Directive for species as the sum of the influences acting upon that species which may affect the long-term distribution and abundance of its populations within a given geographical area.

2.9.2 Confidence in making predictions

Following an assessment of the significance of any residual impacts, a judgement is made for each valued ecological receptor about the degree of confidence in the impact assessment (notwithstanding the fact that the site layout is at a preliminary stage only). A measure of certainty is normally applied, where possible, to the likely success or otherwise of measures that might be used to mitigate negative ecological effects. In addition, the available detail regarding a particular mitigation measure at this stage in the development of the scheme would also affect certainty. In this assessment, confidence in prediction is expressed with reference to the scale described below:

- Certain or Very High Level of Confidence;
- Likely or High Level of Confidence;
- Unlikely or Low Level of Confidence; or
- Very Unlikely or Very Low Level of Confidence.

3.0 RESULTS

3.1 Desk study

Bat records returned by WSBRC in 2014[2] are shown in Appendix 1.1 and reveal 15 bat records from 1957 to 2013 within 2km of the site. Species recorded in the locality have included common pipistrelle *Pipistrellus*, brown long-eared *Plecotus auritus* and noctule *Nyctalus noctula*. The majority of records were from roost surveys undertaken by volunteers, with most being from the villages of Hindon and Fonthill. The location data for these records was limited to a 1km square so it has not been possible to determine exact distance of such records from the site.

Chilmark Quarries Special Area of Conversation (SAC) is situated some 6.3km to the south-east and Fonthill Grottoes Site of Special Scientific Interest (SSSI) lies 2.3km south-east. The SAC is a site of both geological and biological interest and contains a network of undisturbed caves which support large overwintering roosts of greater horseshoe *Rhinolophus ferrumequinum* and lesser horseshoe bats, as well as *Barbastella barbastellus,* Daubenton's *Myotis daubentonii*, natterer's *M. nattereri*, Brandt's bat *M. brandtii* and the largest UK roost of the nationally rare species Bechstein's bat *M. bechsteinii*. The SAC citation is included in Appendix 7.1.

Research at the site has demonstrated that bats from Chilmark travel north using treelines, hedges and open fields to major woodland complexes north of the A303. Many bats have been radio-tracked over 5km or more (Davidson-Watts, 2005 unpublished data). The location of the Chilmark Quarries SAC is shown in AME 2015.

3.2 Transect surveys 2015

3.2.1 Weather conditions

Weather conditions were considered suitable during all the 2015 survey sessions, despite occasional showers during the May session.

Table 3.2.1 – Summary of weather conditions during 2015 transects

Survey number	Date	Temperature °c (start-end)	Wind speed (BF scale)	Cloud cover %	Rain
1	15.05.15	14-12	2	70	Light infrequent showers
2	30.07.15	18-9	1	10	None
3	24.08.15	13-12	1	90	Light at start, none after 21:30
4	17.09.15	15-14	1	30	None
5	08.10.2015	13-11	1	50	None

[2] Will be fully updated prior to any impact assessment prior to a planning application.

3.2.2 Activity Surveys 2015

The five transect sessions captured 472 bat calls - an average of 94.4 passes per night (ppn) - from six species/groups including common pipistrelle, soprano pipistrelle, *Myotis*, barbastelle, long-eared bat (probably *Plecotus auritus*) and *Nyctalus/Eptesicus*. The proportions for each species are shown in chart 3.2.1 below; the majority of passes were from common pipistrelle (82%), with the next most frequent species/group being *Myotis* (8%). Of note is the presence of barbastelle, which made up 5% of the transect bat detector recordings – an unusually high level for a bat that typically occurs in the landscape at low density.

The distribution of records during each transect session is shown by month in Figure 8.7 (Appendix). The data show that the majority of bat activity occurred on the north-eastern and north-western boundaries, with a concentration of activity in the south-east corner adjacent to a mature tree line.

The transect data show that common (and occasionally soprano pipistrelle bats) utilised the majority of the site edge at some point, with particular centres of activity from pipistrelles being noted around the western and south eastern sections of the site.

Low numbers of *Myotis* were recorded at various locations around the site boundary, with no particular cluster of activity being noted. There was a spike in activity from *Myotis* bats during the October transect, which suggests there may be some seasonal movement across the site during autumn; at a time of year when these species are known to move over long distances to mating and hibernation sites.

Barbastelle bat was recorded regularly and was detected on all transect surveys except during the May session. This species was predominantly recorded along the north-western boundary, and also the north-eastern boundary.

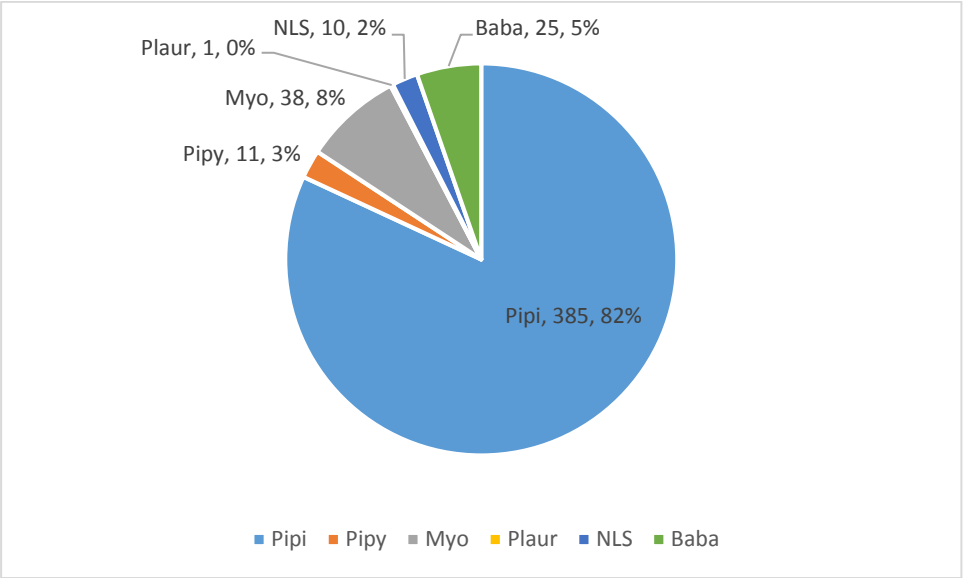
There were sporadic *Nyctalus/Eptesicus* and long-eared recordings from the site with no clear pattern of activity from these species.

3.2.3 Static Logger Surveys 2015

The static loggers recorded a total of 1284 bat passes during the May to October 2015 deployments. The data confirmed the presence of at least eight species/species groups; in addition to the six species identified during the activity surveys, the static loggers also recorded greater and lesser horseshoe bat at low level.

Chart 3.2.2 shows the proportions of bat passes recorded during the surveys. Common pipistrelle (68%) was the most frequently recorded species; this is broadly consistent with the results of the activity surveys and is typical for most sites, since it is the most common and widespread species nationally.

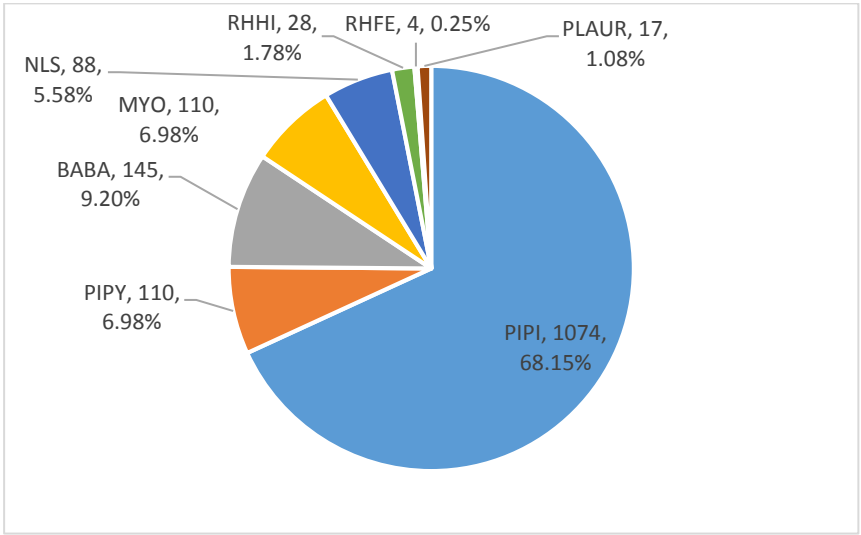
Chart 3.2.1 Proportions of bats from combined transect data 2015



Barbastelle was the second most detected species, with 145 passes (9.2% of static logger records) being assigned to this species; this is a high level of activity.

A total of 28 recordings were from lesser horseshoe bat and only four were from greater horseshoe bat (this was the least detected bat species during the survey).

Chart 3.2.2 Proportion of bat passes by species recorded on static loggers in 2015. Data labels include total number of calls recorded.

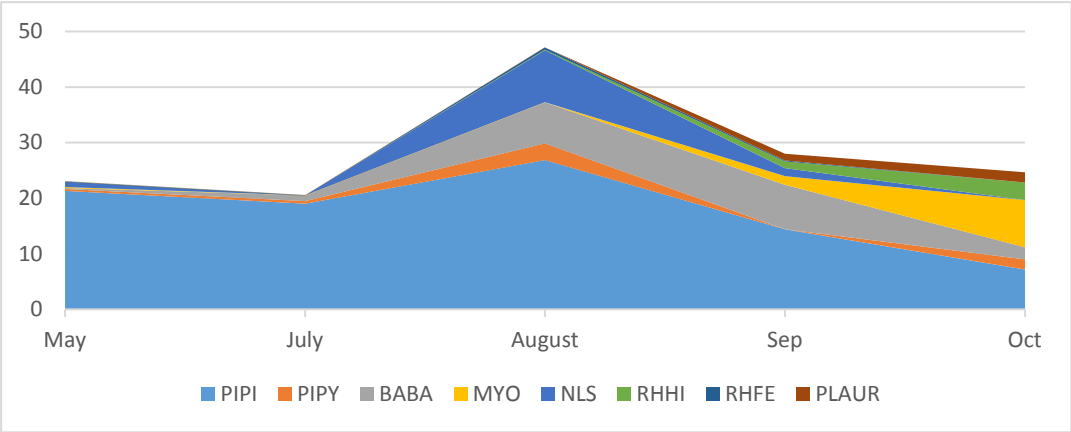


To assess temporal use of the site by bats through the 2015 survey period, data from only one logger (on the northern edge of the site throughout the full survey period) was analysed. The stack chart in Chart 3.2.3 shows the distribution of calls per night from this single logger, with the data being classified by species/species group throughout the survey period. The y axis shows average calls per night proportionately by species; for instance common pipistrelle averaged c.27 calls per night in August and NLS averaged c.9 calls per night in August.

In general Chart 3.2.3 shows bat activity and species diversity were relatively low in May; however both diversity and average number of passes per night (indicative of level of bat activity) increased in August when the highest activity was from *Pipistrellus* spp., barbastelle and bats from the NLS group. From August through to October, activity levels decreased – probably as a result of pipistrelle and NLS activity reducing. This would be consistent with cooling temperatures and a seasonal decline in insect abundance. During the same period however, species diversity increased with long-eared, horseshoe and *Myotis* bats activity increasing (possibly as a result of bats commuting through the site towards mating or hibernation sites).

Data from the single logger throughout summer and autumn revealed that even for the most commonly encountered species (common pipistrelle) the average number of passes per night was 17.2, which from experience of other sites with which the authors (Andrew McCarthy and Dr Ian Davidson-Watts) are familiar is a modest number.

Chart 3.2.3 Mean calls per night by species throughout the 2015 survey period from a single logger



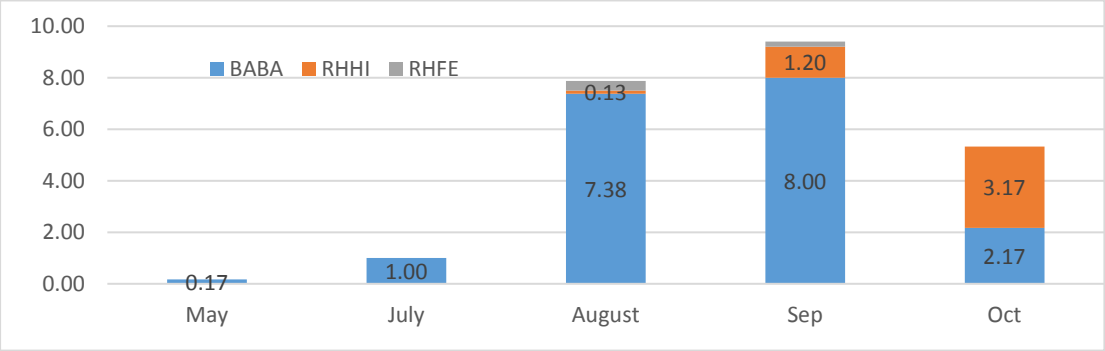
As this assessment aims to inform the emerging scheme design as it relates to potential impacts on the nearby Chilmark Quarries SAC, a separate analysis of logger data was undertaken for relevant Annex 2 SAC qualifying species (barbastelle, greater horseshoe and lesser horseshoe bat). Chart 3.2.4 shows barbastelle being detected throughout the logger survey season, with a maximum average of eight calls per night in September. Horseshoe bats were not detected until August, with an increasing level of frequency thereafter for lesser horseshoe from August through to October. Although greater horseshoe bats were detected in August and September, this species was only detected on four occasions throughout the entire survey period and numbers here are clearly low.

3.2.4 Trapping Surveys

Due to the very open nature of the site, trapping surveys were challenging. The September trapping session did not capture any bats, however during the night of the

8 October 2015 a male adult brown long-eared bat was captured at 21:30 and a male adult natterer's bat was caught at 21:45 at the eastern trap location.

Chart 3.2.4 Average passes per night in 2015 for SAC Qualifying species (from logger on NW boundary)



3.3 Activity Survey - 2018

Weather conditions were suitable during all the 2018 survey sessions (although temperatures dipped to 8 degrees C at the end of the April session).

3.3.1 Weather conditions

Table 3.2.2 Summary of weather conditions during 2018 transects surveys

Survey number	Date	Temperature °c (start-end)	Wind speed (BF scale)	Cloud cover %	Rain
1	16.14.18	12-11	2	<70	None
2	17.05.18	13.4-8	0	Nil	None
3	19.06.18	18-16	1	100	None
4	15.07.18	17-15	1	<10	None
5	16.08.18	17-13	0	0	None
6	09.09.18	13-11	1	50	None

The six transect sessions during the 2018 update transect survey (April-September inclusive) recorded 478 bat calls from six species/groups including common pipistrelle, soprano pipistrelle, barbastelle, long-eared and *Nyctalus/Eptesicus*.

The proportions of total activity for each of these species or species groups are shown in chart 3.2.5 below. Most passes were from common pipistrelle (80.54% of the total) with the next most frequent species/group being *Myotis* bats (5.86%). Barbastelle made up 4.18% of the total, a slight drop from the proportion of the total during the five transect sessions in 2015. During 2018, common (and occasionally soprano pipistrelle bats) utilised the majority of the site edge; as in 2015, there was a particular focus of activity from these species along the western and south-eastern margins of the site, and elsewhere.

Over 5% of the total number of passes were from *Myotis* bats in 2018; these were noted all around the site boundary, but with a particular focus along the north-western edge. Also as in 2015, there was a modest increase in activity from *Myotis* in September, which reinforces the 2015 conclusion that there may be a low-level seasonal movement from these bats around site.

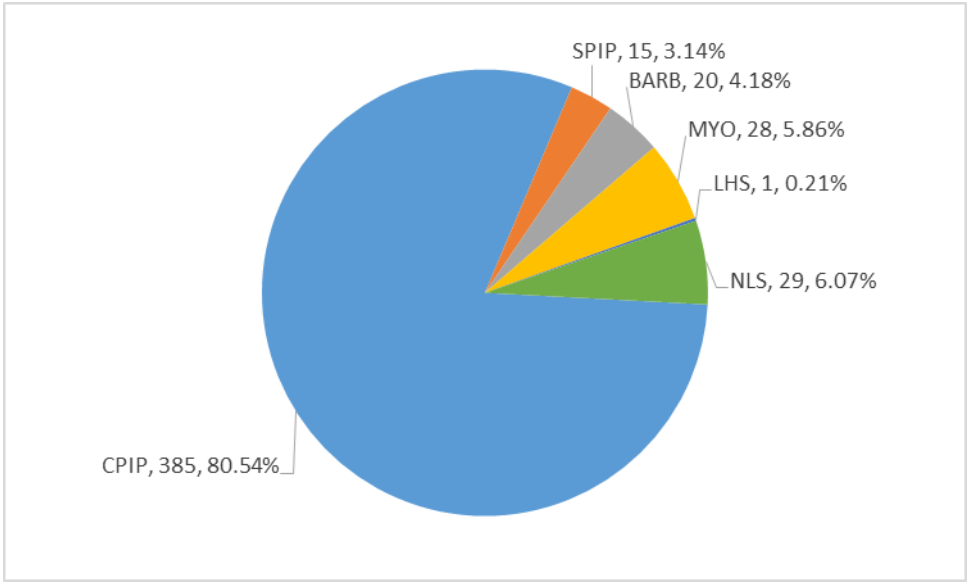
Again, as in 2015, the Annex 2 species barbastelle was recorded regularly throughout the survey at over 4% of total records. The species was detected during all sessions at varying levels of activity, but with a peak in May and September, which suggests some seasonal movement to and from Chilmark. For clarity in respect of future assessment of impacts on the SAC, illustrative 'heap map' outputs for barbastelle from the 2015 and 2018 transect surveys are provided for comparison in the appendix (Figure 8.7). The data show that the majority of bat activity from barbastelle was mainly in the north of the site in both years; it appears to be related to the better-structured habitat in these areas; the tree lines here probably support higher levels of insect prey as well as providing defined linear structures to aid bat navigation.

Only one record was made for lesser horseshoe, and there were no records for greater horseshoe; again this was broadly consistent with the results in 2015 (when the latter species was only recorded once).

Passes from *Nyctalus/Eptesicus* species were occasional only and overall the species were recorded at moderate level only.

Long-eared bats were not recorded in 2018.

Chart 3.2.5 Results from 2018 transect surveys



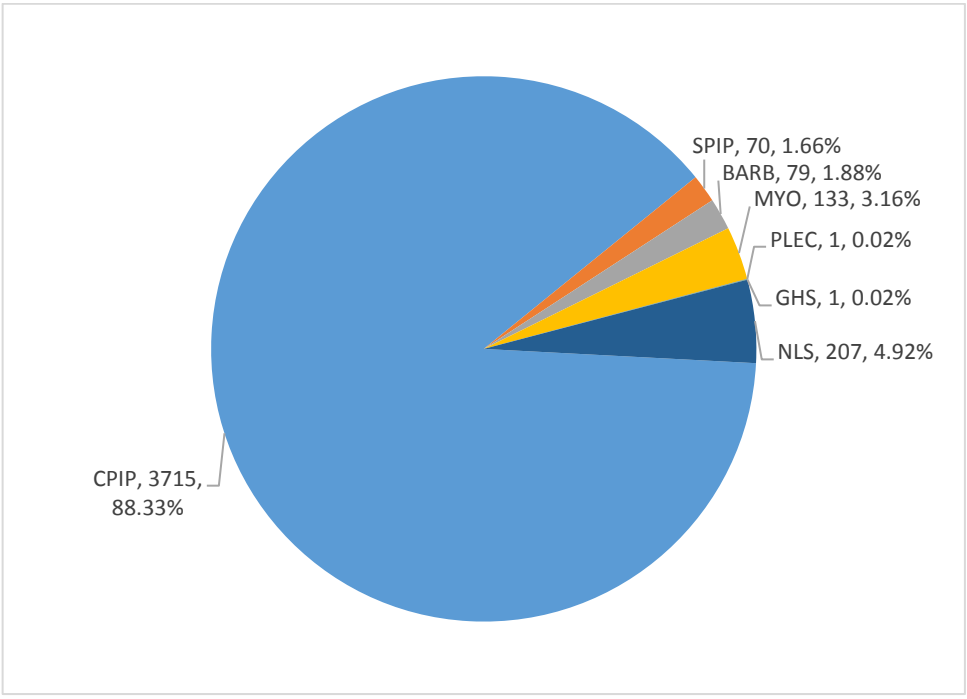
3.3.2 Static Logger Surveys 2018

The pair of static loggers deployed over three 5-night sessions in 2018 recorded a total of 4206 bat passes (May, July and September 2015; 30 logger nights in total compared

to 27 logger nights in 2015). The logger data recorded at least seven species/species groups in 2018, which is broadly consistent with the eight species in 2015 (lesser horseshoe bat was not recorded in 2018, unlike in 2015). Chart 3.2.6 shows the proportions of bat passes recorded during 2018: common pipistrelle at 3715 passes comprised 88.3% of the records; this was by far the most frequently recorded species and the numbers of passes for it was more than double the total for the same species in 2015. *Nyctalus* bats were the second most detected species/group with 207 records (4.92% of the total in 2018); *Myotis* bats were the third highest with 133 records (3.16% of the total); barbastelle was the fourth most detected species with 79 passes (1.88% of records) and soprano pipistrelle was the fifth most detected bat species with 70 passes being detected (1.66% of the total). Only one pass from long-eared and one pass from greater horseshoe bat was detected during the 2018 logger survey; negligible levels of activity for these species is consistent with the findings of the transect survey and similar to the results of the logger survey 2015. Lesser horseshoe was not detected in 2018, unlike in 2015 when 21 recordings were made for this species on the static loggers.

Because the 2015 and 2018 static surveys differed from each other slightly in duration (the 2015 survey operated over 27 survey nights, whilst the 2018 survey was over 30 nights) data sets are better compared using passes per night (ppn) instead of total number of passes (based on an 8-hour night). When this index of activity is used, the level for barbastelle in 2018 is around half that in 2015 (but still high) - i.e. 2.6 ppn in 2018 on the static loggers compared to 5.37 ppn in 2015. *Myotis* numbers were slightly higher at 4.43 ppn in 2018, compared to 4.07 ppn in 2015.

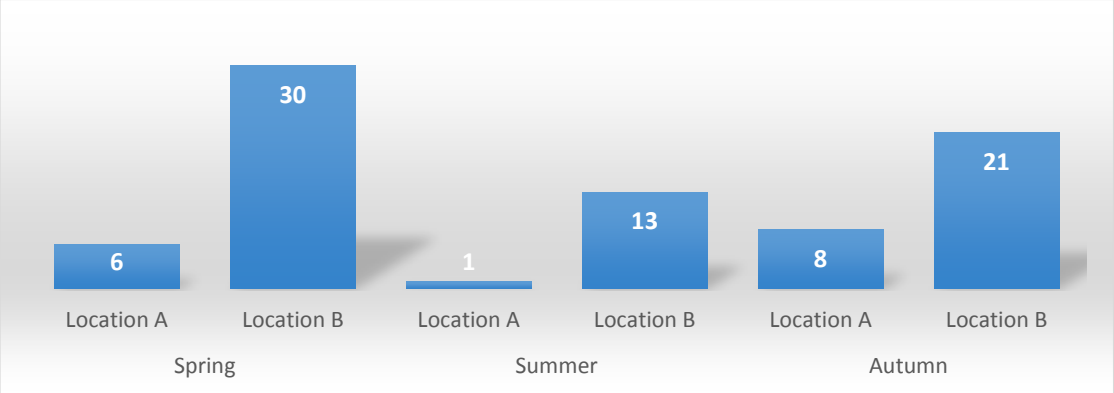
Chart 3.2.6 Bat passes by species on static loggers 2018.



Importantly the key species (barbastelle) still routinely uses the site in good numbers and the *pattern* of activity across the site was broadly the same during each of the survey years, with the north-western and north-eastern boundaries being consistently the most heavily used areas.

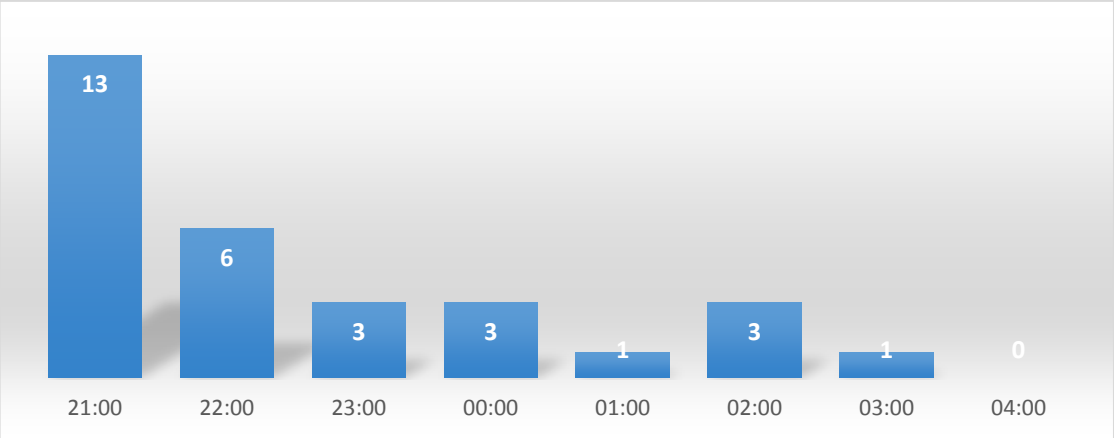
The use of two loggers in 2018 during each deployment periods yielded some interesting results in terms of use levels between the north-west and north-east hedges; in all cases and for all species the number of passes was substantially higher for static detector B on the north-eastern boundary, compared to detector A on the north-western boundary. Chart 3.2.7 shows the results by detector for barbastelle.

Chart 3.2.7 Differences between Loggers A and B (north-western and north-eastern boundaries respectively) across full season for barbastelle (showing number of passes).



The times of barbastelle passes recorded on Logger B was also analysed in detail, with reference to the time each bat passed the static unit. Some 43% of passes were recorded during the first hour around dusk, which suggests that these may be bats passing through the site following emergence - i.e. commuting through rather than stopping to feed.

Chart 3.2.8 Times of barbastelle passes (broken down by hour through the nights) recorded at Logger B during 2018 survey



4.0 RELEVANT LEGISLATION & POLICY[3]

4.1 Legislation

4.1.1 Wildlife and Countryside Act (as amended)

In England, Scotland and Wales all bat species are fully protected under the Wildlife and Countryside Act 1981 (WCA) (as amended) through inclusion in Schedule 5. In England and Wales, this Act has been further amended by the Countryside and Rights of Way Act 2000 (CRoW). In addition sites of special scientific interest (SSSIs) can be designated for important bat populations, usually associated with hibernation or breeding. Local planning authorities are required to consult Natural England (in England) before granting planning permission that may affect an SSSI. Chilmark Quarries and Fonthill Grottoes are designated as SSSIs.

4.1.2 Conservation Regulations

European Protected Species

All bats are also included in Schedule 2 of The Conservation of Habitats and Species Regulations 2010, (the Habitats Regulations), which defines 'European protected species (EPS) of animals'. These various pieces of legislation almost parallel each other, with a few small differences in wording. The legal significance of these differences has not yet been fully established and so the following account attempts to combine them to provide a simplified summary of the relevant provisions. Taken together, the Act and Regulations make it illegal to:

- Intentionally or deliberately kill, injure or capture (or take) an EPS;
- Deliberately disturb an EPS;
- Recklessly disturb an EPS or obstruct access to breeding site or place of shelter (England & Wales only); and
- Damage or destroy 'any structure or place which any EPS uses for shelter or protection.

European Union Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats and Species Directive) places a legal requirement on all Member States of the European Union to protect specified habitats and species through their own domestic legislation. In the UK this has been implemented by the Conservation of Habitats and Species Regulations (2010). All species of bats are on Annex IV ('European protected species (EPS) of animal'), which requires that they are given full protection.

European sites (e.g. SACs)

With respect to European sites such as the Chilmark Bats SAC, Circular 06/2005 Biodiversity and Geological Conservation – statutory obligations and their impact within

[3] The legal summary is for guidance only; if more information is required, please consult the original legal documents.

the planning system from the former ODPM provides guidance which makes clear the obligation upon local planning authorities (the 'competent authorities') to ensure that developments have no adverse effect upon such sites, either individually or in combination with other plans or projects i.e.:

> *"Regulation 48 of the Habitats Regulations restricts the granting of planning permission for development which is likely to significantly affect a European site and which is not directly connected with or necessary to management of the site, by requiring that an appropriate assessment is first carried out of the implications of the development for the site's conservation objectives. Regulation 49 requires an authority proposing to allow development that it cannot be ascertained will not adversely affect a European site to notify the First Secretary of State."*

The 'Waddenzee judgement' of the European Court of Justice (ECJ) is pertinent here. The Court ruled that a project may only be authorised if the competent authority is certain that the plan or project would not adversely affect the integrity of the European site - i.e. there should be "no reasonable scientific doubt… as to the absence of such effects" (ODPM Circular). Clearly in order for there to be no reasonable scientific doubt, sufficient ecological baseline survey is required upon which to base the impact assessment and mitigation strategy.

A recent judgement of the Court of Justice of the European Union (People over Wind, Peter Sweetman v Coillte Teoranta that Article 6(3) stated that the Regulations must be interpreted as meaning that mitigation (measures that are intended to avoid or reduce effects) must be assessed within the framework of an Appropriate Assessment and that it is not permissible (as previously) to take account of such measures at the screening stage.

https://www.cieem.net/news/482/planning-inspectorate-publishes-people-over-wind-ruling-note)

In undertaking their assessment, a local authority is required to screen and record the assessment of LSE in order to formally identify the requirement for an appropriate assessment, and in so doing must consult Natural England.

4.1.3 The Natural Environment and Rural Communities (NERC) Act

The 'NERC' Act came into force on 1st Oct 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of Habitats and Species of Principal Importance for the Conservation of Biodiversity in England. This 'Section 41 list' is used by decision-makers such as public bodies, including local and regional authorities, when implementing their duty under the Act to 'have regard to the conservation of biodiversity in England, when carrying out their normal functions'. Fifty-six habitats and 943 species are included on the S41 list. These are all the habitats and species in England that were identified as requiring action in the UK Biodiversity Action Plan (UK

BAP); they continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

4.2 National Planning Policy (NPPF)

In July 2018, the revised National Planning Policy Framework was published. The new document sets out the government's current planning policies in England and describes how these should be applied in a local development context. The 2018 document replaces the previous 2012 version, Chapter 11 of which outlined how the UK planning system can 'contribute to, create, enhance and protect' the environment, by minimising impacts on biodiversity and where possible drive delivery of Net Biodiversity Gain (NBG)[4]. The revised document continues the approach of its predecessor, and includes an emphasis on the presumption in favour of sustainable development. It continues to refer to NBG, a consultation on the national roll-out of which is reportedly imminent.

4.3 Local Planning Policy

4.3.1 General: biodiversity and development

The relevant local planning document is the Wiltshire Core Strategy (Adopted 20 January 2015). Core Policy 50 - Biodiversity and Geodiversity - is listed under Section 6 Delivering strategic objective 5: protecting and enhancing the natural, historic and built environment.

Coe Policy 50 Biodiversity and geodiversity

- Protection Development proposals must demonstrate how they protect features of nature conservation and geological value as part of the design rationale. There is an expectation that such features shall be retained, buffered, and managed favourably in order to maintain their ecological value, connectivity and functionality in the long-term. Where it has been demonstrated that such features cannot be retained, removal or damage shall only be acceptable in circumstances where the anticipated ecological impacts have been mitigated as far as possible and appropriate compensatory measures can be secured to ensure no net loss of the local biodiversity resource, and secure the integrity of local ecological networks and provision of ecosystem services.
- All development proposals shall incorporate appropriate measures to avoid and reduce disturbance of sensitive wildlife species and habitats throughout the lifetime of the development.
- Any development potentially affecting a Natura 2000 site must provide avoidance measures in accordance with the strategic plans or guidance set out in paragraphs 6.75-6.77 above where possible, otherwise bespoke measures must be provided to demonstrate that the proposals would have no adverse effect upon the Natura 2000

[4] Formal guidance for delivery of biodiversity gain is presently being developed by the CIEEM.

network. Any development that would have an adverse effect on the integrity of a European nature conservation site will not be in accordance with the Core Strategy.

- All development should seek opportunities to enhance biodiversity. Major development in particular must include measures to deliver biodiversity gains through opportunities to restore, enhance and create valuable habitats, ecological networks and ecosystem services. Such enhancement measures will contribute to the objectives and targets of the Biodiversity Action Plan (BAP) or River Basin/ Catchment Management Plan, particularly through landscape scale projects, and be relevant to the local landscape character.

4.3.2 Guidance in respect of European sites

Further planning guidance is available through the Wiltshire Bats Special Areas of Conservation Planning Guidance document (dated 10 September 2015) which is applicable to all development types in the areas within and surrounding Chilmark Quarries SAC. The site lies within the Bat Consultation Zone for Chilmark Quarries SAC Development proposals, where development could potentially trigger impacts on the SAC by affecting foraging areas and/or commuting corridors. The site is identified as being within the core areas for greater horseshoe and barbastelle bat, which is the landscape surrounding the SAC roosts that are regularly used for foraging and commuting by these species. Where a site lies within a core area, the following potential impacts would need to be considered at an early stage:

- Physical changes through loss, damage or change of management of potential foraging habitat, removal / fragmentation / modification of habitats in a potential commuting corridor; and
- Lighting through artificial lighting close to potential roosting, foraging and commuting features.

Where survey work has confirmed that a sensitive feature used by a SAC species is likely to be affected, a mitigation strategy will need to be submitted with the planning application. The basic principles of development identified include:

- Maintain dark corridors around foraging areas and commuting corridors with no net increase in light levels as a result of the development in areas used by bats;
- Locate potential sources of disturbance away from bat roosts and bat habitats to avoid impacts;
- Maintain the extent and quality of all semi-natural habitats in foraging areas and commuting routes and design the development around existing habitats.

The mitigation strategy must set out how potential impacts will be avoided as part of the application. The scope of this document will be dependent on the nature and scale of the anticipated impacts, but may include the following elements:

- Construction Method Statement;
- Details of roosts to be altered / created – dimensions, materials etc;
- Pre and post-development lux plots; Post-construction monitoring scheme; and
- Ecological management plan.

The information will be used by the Council to determine whether the proposal is likely to have a significant effect on the SAC. The Council will screen for any 'likely significant effects'16 (based on the activities and impacts outlined in Table 1) to determine the requirement for an 'appropriate assessment' under the Habitats Regulations.

5.0 DISCUSSION AND EVALUATION

5.1 Discussion

The trapping, logger and transect survey data from 2015 and the results from the updated survey in 2018 show that bats were detected on the site during all survey sessions and that the site supports at least eight species. Although transect studies focussed on the site boundaries (the central section was under an arable crop at the time of survey) there were very few observations of bats foraging or commuting over the open field and almost all activity was found to be around hedges and along tree lines around the site boundaries. There edges are therefore where the main thrust of mitigation is proposed.

Given the relatively low average ppn for greater and lesser horseshoe bat, *Nyctalus*/Serotine, common pipistrelle, soprano pipistrelle, *Myotis* and long-eared bats, it is concluded that the site provides low quality foraging habitat for these species, but some (*Myotis* in particular) may pass through the site regularly at certain times of the year, perhaps *en-route* to swarming sites elsewhere in the locality (e.g. Chilmark). The data suggest that the eastern boundary hedgerow is the main feature used by small numbers of commuting horseshoe bats. The low numbers of passes for these species at the Site support research that both greater and lesser horseshoe bats prefer woodland and pasture as foraging (Duverge and Jones 2004; Schofield, 2008) and the rather open site and its immediate surroundings is unlikely to provide a significant foraging resource for these two Annex II bat species.

The low number of *Myotis, Nyctalus*/Serotine, soprano and long-eared bats are also likely to be commuting individuals, although it is possible that there is also an element of foraging taking place. This assumption is supported by the capture of male brown long-eared and natterer's bats; whilst research has shown that breeding colonies of these species prefer woodland habitats (Smith and Racey, 2002; Entwistle, Racey and Speakman, 1997), males are often found using what would be considered sub-optimal foraging habitat such as treelines and hedgerows (Davidson-Watts, 2008). It may also be that long-eared bats were under-recorded due to this species having a low amplitude echolocation call (Russ, 2012); therefore activity from this species may in fact be higher. Notwithstanding, the low levels of bat passes for *Myotis*, *Nyctalus*/Serotine and long-eared bats indicates that the site is probably not a significant foraging resource for these species.

The likelihood of some of the recorded *Myotis* bat passes being from Bechstein's bat (the fourth Annex II species for which the SAC is designated) is considered to be low; mainly because it is a species that uses quiet echolocation calls. Therefore even if it were to be present it is likely to be under-recorded. The trapping surveys with the acoustic lure were used to try and establish presence of this species on site. This is generally a very effective method (Hill and Greenaway, 2005), since Bechstein's specific

calls are used to lure nearby bats of this species to the trap. Despite the use of this method, the species was not captured. It can therefore be concluded that whilst Bechstein's may use the site periodically, usage is unlikely to be significant and is probably limited to occasional commuting (if indeed it is present at all).

By contrast to the above species, common pipistrelle and barbastelle consistently used the site throughout 2015 and 2018; these species were recorded on all logger surveys and during the majority of transect surveys during both years. The results indicate that both species are using the site for foraging and for commuting. These species ecological requirements are discussed in more detail below:

Common pipistrelle is a wide ranging and relatively abundant species nationally. Davidson-Watts, Jones and Walls (2006) found that the common pipistrelle is a generalist forager which uses a wider variety of mainly woodland-edge habitats for foraging and commuting. In addition, the location of this site adjacent to the settlement of Hindon would provide a variety of nearby roosting opportunities for this species, which is mainly associated with buildings.

Barbastelle is by contrast a nationally rare bat that roosts primarily in trees. It is a wide ranging species which is known to have average foraging range of between 6 and 7km, and in southern England it is known to forage in floodplains and woodlands (Zeale, Davidson-Watts and Jones, 2012). More recent studies in Lincolnshire (Davidson-Watts, 2014) have found this species to forage around treelines, hedgerows and small copses in arable habitats, and in that study found it generally avoided woodland. Research suggests that barbastelle bats generally strongly avoid flying in (lit) urban areas, although bats have been found foraging approximately 25m from street lamps when buffer vegetation/treelines are present.

The detection of three Annex II species (greater and lesser horseshoe at low level and barbastelle in consistently good numbers over two seasons) on what would generally be considered moderate to low quality habitat for bats is not surprising, given the context in which the site is situated. It lies between several significant areas of woodland, wetland and internationally important hibernation and swarming sites for multiple bat species; Fonthill Grottoes and Chilmark Quarries lie nearby to the south and there is extensive wooded habitat around 5km north known as the Great Ridge. Although hedgerows around the Site are not well-structured, they are situated in what is otherwise a rather open landscape and they appear to provide an important ecological linkage, particularly for barbastelle bats, between the various habitat-areas mentioned above.

5.2 Evaluation

Horseshoe bats

Greater and lesser horseshoe bats were detected occasionally on the eastern boundary of the site during the autumn 2015 but rarely in 2018 (this may be the result of detector sensitivity) and the logger data suggests that they were using this feature for occasional commuting. Both greater and lesser horseshoe are considered rare in the UK, with their distribution being restricted to Wales and south west England. They are both qualifying features of the nearby Chilmark Quarries SAC and, despite a low level of use of the site by these species, due to their conservation status and given the proximity to the nearby SAC, the eastern boundary of the site is considered of County importance for greater and lesser horseshoe bats.

Barbastelle bat

This species was detected regularly using the north-eastern and north-western site boundaries for foraging and commuting during both the 2015 and 2018 surveys. Although barbastelle is widespread across England and Wales, it is rare throughout, with breeding colonies requiring home ranges of over 120km^2 (Zeale et al 2012). Given the proximity of the nearby SAC (for which this species is a qualifying feature) and in view of the regular use of the Site, the better structured north-west and eastern boundaries (which are characterised by tree lines) are assessed as being of potential National importance for this species.

Myotis bats

This species group was detected in greater numbers towards the end of the 2015 and 2018 survey periods (i.e. during autumn) and although there may be low level foraging taking place, the main use of the site appears to be for commuting. *Myotis* bats are the main species group known to swarm at Chilmark Quarries and Fonthill Grottoes (Parsons *et al,* 2003) and an increase of commuting activity at the Site during autumn may relate to bats commuting though to visit one or both of these underground sites. With the exception of Bechstein's and the newly discovered Alcothoe bat species, the other *Myotis* bat species (Natterer's, Daubenton's, Whiskered and Brandt's bats) are relatively widespread nationally, and their populations are either stable or increasing (BCT, 2017). Although it is not confirmed as present on the site, Bechstein's bats could move through the area to visit swarming sites in the SAC as part of the *Myotis* assemblage, therefore a precautionary approach has been adopted to this evaluation. Taking these factors into account, the Site is considered of County importance for *Myotis* bats.

Noctule/Leisler's (Nyctalus) and Serotine bats

This group of bat species were recorded on the site mainly during summer 2015 with a peak in August and also in 2018. Only 88 bat passes (2.5 ppn) were recorded in 2015 and 207 (3.4 ppn) in 2018; this is a low level of activity. The records were likely to be from bats commuting through / across the site as the arable field is rather suboptimal for these bats. All three species have a similar conservation status, although noctule is widespread throughout the UK and serotine is restricted to the central and southern England. Given the low number of passes detected for these species during the activity and logger surveys in both 2015 and 2018, the site is considered of likely Site-level importance to these species.

Pipistrelle bats

Common pipistrelle was the most abundant bat detected during the surveys and this species used all boundaries at some point during 2015 and 2018. However, despite being the most frequently detected bat in both surveys, the average number of passes per night was 17.2 in 2015 (a relatively low level) but much higher (61.0 pp) in 2018.

Soprano pipistrelle bats also occurred regularly on site, but at low level in both survey years. Common pipistrelle populations are increasing and soprano pipistrelle populations are stable nationally (BCT, 2017) and as a result the site is considered to be of Site-level importance for these species.

Long-eared bats

The capture of a male brown long-eared bat and the detection of relatively low numbers of passes (only one in 2018 during the static logger survey) suggests the site is not a significant foraging resource for these species. Brown long-eared bats are relatively common and abundant nationally, with a stable population (BCT, 2017). The site is therefore considered to be of Site-level importance for long-eared bats.

5.3 Potential Impacts (tbc following detailed scheme / mitigation design)

The evaluation highlights the importance of some of the site boundaries to a range of bat species; in particular the north-west and north-eastern edges; these provide commuting and foraging habitat for a range of species, including three SAC qualifying bats - the two horseshoe species and barbastelle.

A proposed residential development is likely to have a number of potential impacts on bats associated with it. These include:

- Direct impact resulting from habitat loss and fragmentation as a result of the removal of hedgerows and tree-lines (or sections of such) which are used by bats for feeding and navigation.
- Indirect impacts as a result of artificial lighting spill into bat habitat; this may deter bats from the area and could also affect prey behaviour (e.g. moths) during construction (from security lighting) and post-construction (from street

lighting and lighting from dwellings). Artificial lighting has been shown to have negative effects on commuting and foraging bats, and species from the *Myotis*, horseshoe, long-eared groups and barbastelle bat are all considered particularly sensitive (Stone, 2013). By inadvertently lighting commuting routes and foraging habitats, bats travelling to important bat site such as Chilmark Quarries may be deterred resulting in use of longer routes, thus using valuable energy resources in the process.

5.4 Outline mitigation recommendations

The aim of mitigation must be to ensure retention of functional key bat foraging and commuting habitat in the scheme design; in particular for the Annex 2 bat species barbastelle, which is highly sensitive to artificial lighting spill and which is (along with both horseshoe species) a SAC qualifying taxa for the Chilmark Quarries SAC. In view of the potential for negative impacts upon the special interest of the SAC - in particular through light spill into adjacent habitat - the following mitigation measures are likely to be key to a successful planning application in respect of ecology:

1. Retain the integrity of the northern and north-eastern habitat boundaries to provide a dark linear framework used by foraging and commuting bats, post development.
2. Focus development towards the southern half of the site as far as possible, leaving as wide and as dark a buffer as possible along the north-western and north-eastern edges. The reason for this is because of the clear potential for a Likely Significant Effect (LSE) upon the qualifying features of the SAC; principally as a result of light spill and development encroachment into presently dark vegetated field margins. It will be vital to be able to demonstrate to the LPA an acceptable lighting plan at the application stage, since recent European case law suggests that a Habitats Regulations Assessment (HRA) will be needed (this would normally be compiled by the LPA) and that an Information for Habitats Regulations Assessment (IfHRA) report will need to be prepared in support of the planning application.
3. Retained buffers should be as broad as possible (ideally <15m wide and ideally more for barbastelle) and may require planting with trees/shrubs to enhance foraging, provide screening from light spill and strengthen the linear nature of these features with respect to their bat commuting function.
4. Screen planting (for light spill) should be planted as soon as possible in order to ensure that vegetation is sufficiently well-developed prior to completion of the development. A short term solution would be to use temporary screening (such as woven willow screens) on earthen banks.

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7.0 APPENDIX 8 – DESK STUDY DATA

7.1 Chilmark Quarries Special Area of Conservation Citation

COUNTY: WILTSHIRE SITE NAME: CHILMARK QUARRIES

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authorities: SALISBURY DISTRICT COUNCIL, Wiltshire County Council

National Grid Reference: ST 975312 and ST 973312 Area: 9.65 (ha.) 23.85 (ac.)

Ordnance Survey Sheet 1:50,000: 184 1:10,000: ST 93 SE

Date Notified (Under 1949 Act): 1977 Date of Last Revision: –

Date Notified (Under 1981 Act): 1989 Date of Last Revision: 1990

Other Information:
Within the Cranborne Chase and West Wiltshire Downs Area of Outstanding Natural Beauty.

Description and Reasons for Notification:
Chilmark Quarries is a site of both geological and biological special interest.

Geologically, it is of great importance for the exposures which the quarries provide through a sequence of rocks of late Jurassic age, some 135 million years old. The quarries have been studied by geologists for over a hundred years and have yielded abundant and well-preserved fossils. The rocks seen here belong to the upper part of the Portland Beds and the lower part of the overlying Purbeck Beds, and allow detailed studies to be made of the major changes in environmental conditions which were occurring in southern England during late Jurassic times. Chilmark Quarries provide the only significant major exposures of these rocks away from the Dorset coast. The Portland Beds consist of a series of marine limestones, including a unit known as the Chilmark Oolites which occurs only in the area of the Chilmark ravine. They are followed by the basal Purbeck Beds which were laid down under non-marine conditions, and which include fossil soil beds, fossil coniferous trees in positions of growth and characteristic thin-bedded limestones.

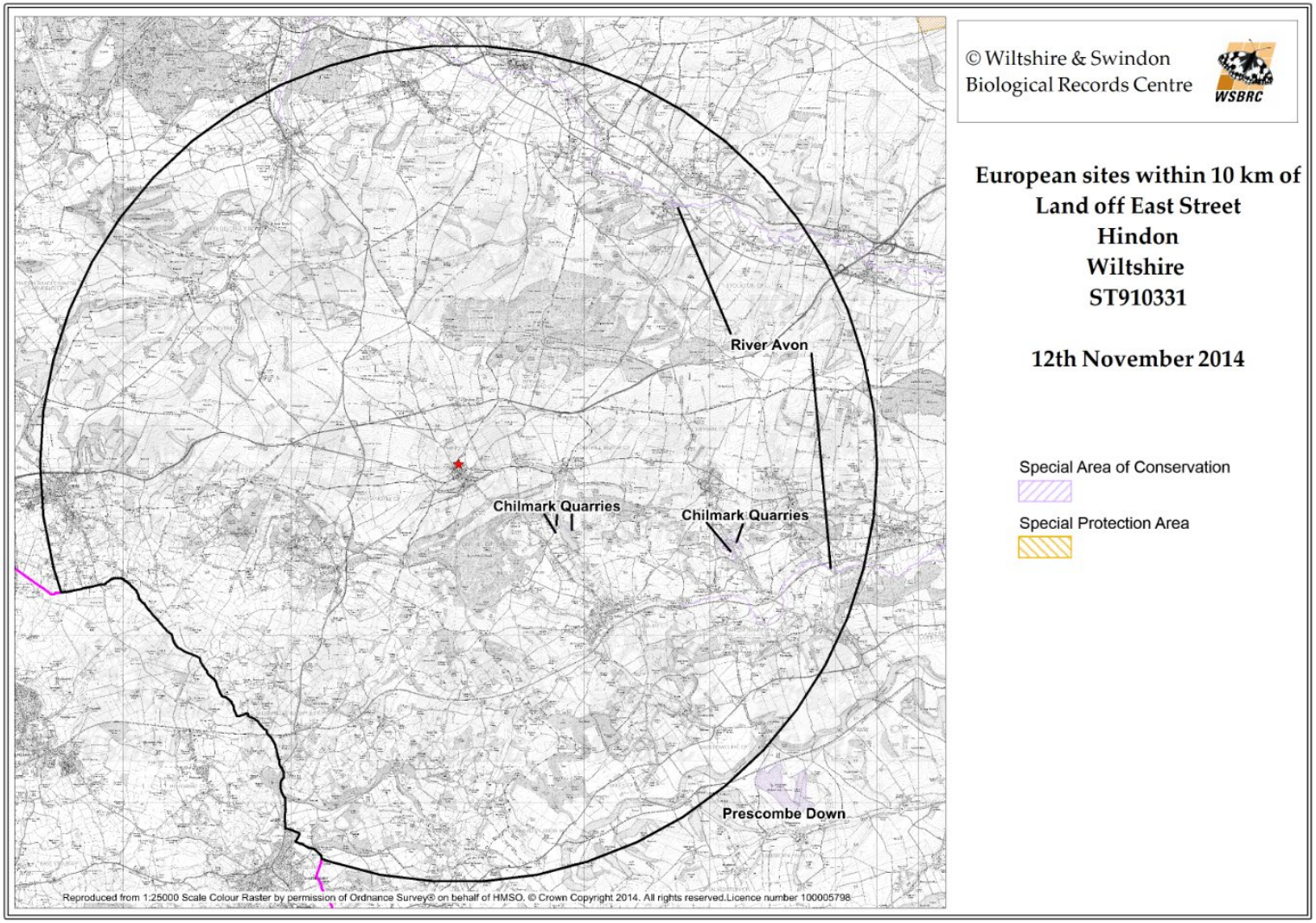
Biologically, the site derives its importance from the large wintering bat roosts which the extensive system of undisturbed caves and their associated steady temperatures are able to support. Such roosts comprise a diversity of species including Greater and Lesser Horseshoe *Rhinolophus ferrumequinum* and *R. hipposideros*, Daubenton's *Myotis daubentonii*, Natterer's *M. nattneri*, Brandt's *M. brandti* and Bechstein's *M. bechsteini*. Bechstein's bat is very rare in Great Britain and Chilmark Quarries represents the largest wintering roost of this species in the country. An average winter population total (for all species) of approximately 150 bats has been recorded since 1981.

7.2 Desk Study Results from 2015 survey

Species Name	Common name	Grid ref	Location	Date	Abundance	Comment
Chiroptera	Bats	ST9232	Hindon, Salisbury	16/02/2010	1 count of droppings	Bat droppings indicating a small number of bats over a number or years
		ST9333	Fonthill Estate	16/03/1992		Bat roost cleared of accumulated droppings, sealed and replaced with bat box by Wilts. Bat Group.
		ST9132	Hindon, Swindon	08/09/1992		Numerous access points under soffits/between slates. Roost in roof apex. Droppings typical of long-eared and pip.
Nyctalus noctula	Noctule bat	ST9131	Fonthill	02/03/1957		
Plecotus auritus	Brown long-eared bat	ST9233	Berwick St Leonard SP3 5SN	16/03/1999		Small scattering of droppings near loft access.
		ST0932	Marsdon, The Down, Hindon	02/07/1997		Small amount of droppings.
		ST9132	Hindon	06/10/2000	Bat count	Bat roost in roof apex.
		ST9132	Salisbury SP3 6EL	29/10/2013		Recorded in dwelling

Pipistrellus	Pipistrelle bat species	ST9231	Fonthill Gifford	07/04/1987	Bat count	Droppings
		ST9333	Fonthill Estate	01/01/1993	Bat count	Large summer pip roost.
Pipistrellus	Common pipistrelle	ST9231	Fonthill Gifford	11/04/1987		Droppings in attic
		ST9131	Fonthill	30/11/1954		In caves
		ST9131	Fonthill	31/01/1959		
		ST9131	Fonthill	31/01/1960		
		ST9131	Fonthill	02/03/1957		

7.3 Chilmark Quarries SAC Location Map



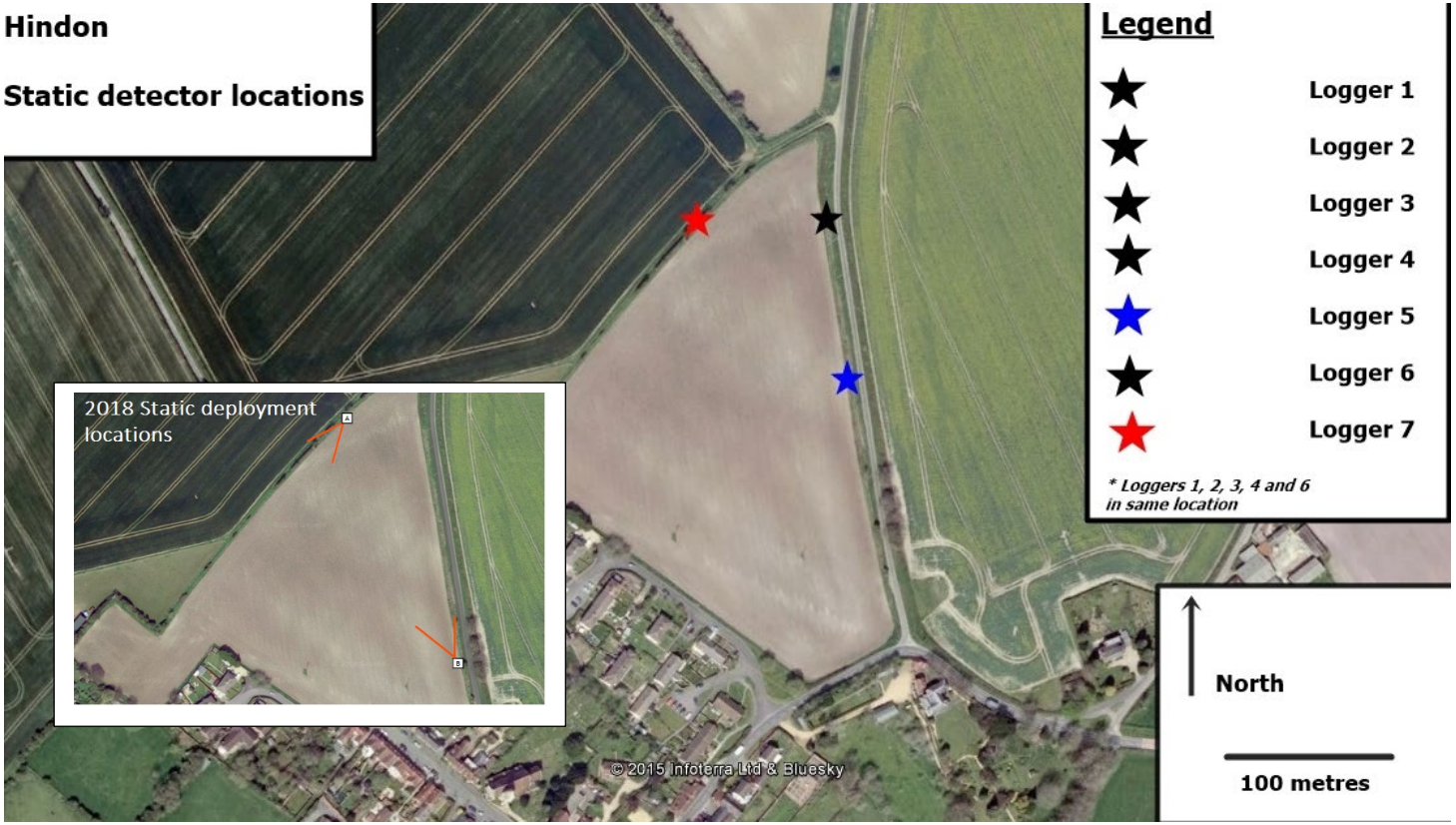
8.0 APPENDIX 7 - FIGURES

8.1 Site Location Plan

8.2 Red Line Boundary

8.3 Transect Route 2015 and 2018 (logged using Batlogger M)

8.4 Location of Static detectors during 2015 and 2018 (inset)



8.5 Harp trapping Locations 2015

8.6 Bat Activity Maps

8.6.1 Transect 1 15th May 2015

8.6.2 Transect 2 30th July 2015

8.6.3 Transect 3 24th August 2015

8.6.4 Transect 4 17th September 2015

8.6.5 Transect 5 8th October 2015

8.7 Activity map for barbastelle (2018 on left and 2015 on right)