



# Wildwood Ecology



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## BAT ACTIVITY SURVEY REPORT

ASH FARM, DRYBROOK

ANN SULLIVAN AND HAZEL BULLOCK

DOCUMENT REF: WWE19178/BAS | 28/10/2019

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Survey dates:	Dawn survey – 29 <sup>th</sup> August 2019 Dusk survey – 11 <sup>th</sup> September 2019
Surveyed by:	Jessica Snow
Architect/Agent:	Verity Wood
Planning reference:	N/A

## VERSIONING AND QUALITY ASSURANCE

Rev	Status	Date	Author(s)	Reviewed by	Approved by
A	Draft	07/10/2019	Jessica Snow Assistant Ecologist	Richard Dodd Principal Ecologist	
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## DISCLAIMER

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The evidence which we have prepared and provided is true and has been prepared and provided in accordance with the guidance of The Chartered Institute of Ecology and Environmental Management’s Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

## SUMMARY

Purpose	<p>Wildwood Ecology was commissioned by Ann Sullivan and Hazel Bullock (the client) to undertake roost characterisation surveys of Ash Farm, Drybrook.</p> <p>The site is the subject of a planning application for the proposed conversion of the barns to residential use.</p>
Work Undertaken	<p>Previous survey information was available, a preliminary roost assessment was undertaken by Focus Ecology (2019)</p> <p>A desk study and bat activity surveys were undertaken in line with the Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd edn (2016).</p>
Key issues	<p>Bat roosts for three species were confirmed within the onsite building.</p> <p>A day roost for myotis sp (X2) was confirmed in barn 3</p> <p>A day roost for common pipistrelle (X2) was confirmed in barn 2</p> <p>Two day roosts for common pipistrelle (X2 &amp; X5) were confirmed in barn 3</p> <p>A night roost for common pipistrelle (X2) was confirmed in barn 3</p> <p>A night roost for lesser horseshoe was confirmed</p>
Recommendations	<p>A European Protected Species licence for bats must be obtained in order for the works to be legally undertaken. This will require the implementation of mitigation and compensation measures.</p> <p>The outdoor privy will be retained to allow continued use by lesser horse bat as a night roost.</p> <p>Three bat boxes will be installed on the exterior walls of the converted barns, these will be suitable for crevice dwelling bats</p> <p>A lighting plan will be required.</p>
Conclusions	<p>Providing that the recommendations outlined within this report are successfully implemented, it should be possible for the proposed development to proceed and for there to be no long-term impacts upon the key protected species present at the site.</p> <p>This ecological report will remain valid for a period of 12 months from the date of the last survey – i.e. until September 2020.</p>

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## 1 INTRODUCTION

- 1.1 Wildwood Ecology was commissioned by Ann Sullivan and Hazel Bullock (the client) to undertake roost characterisation surveys at Ash Farm, Drybrook (the site) centred at grid reference SO 634 175.
- 1.2 A preliminary roost assessment (PRA) for bats was undertaken at the site on the 6<sup>th</sup> June 2019 by Focus Ecology Ltd. This found two of the barns to have moderate suitability for use by bats, further bat activity surveys were therefore recommended.

### Site description

- 1.3 Ash farm is located approximately 1km east of Drybrook, Gloucestershire. The aerial image of the site (Appendix I) shows the site to consist of three agricultural barns.
- 1.4 Within the wider area surrounding the site is dominated by agricultural land connected via mature hedgerows.

### Proposed development

- 1.5 The site is the subject of a planning application for the proposed conversion of the barns.

### Purpose of this report

- 1.6 This report aims where possible to provide sufficient information for the local planning authority to fully assess the potential ecological impacts of the proposed development, or alternatively, to identify what further information is required to fully inform the scheme.
- 1.7 The results of the bat activity surveys have been used to establish the need for, and extent of, any mitigation or compensation measures required as part of the proposed development.



Figure 1 – Aerial image of the site location (red boundary)

## 2 METHODOLOGY

### Desk study

#### Previous survey

2.1 Previous survey information was available for the site. Focus Ecology Ltd was commissioned by the client to undertake a Preliminary Roost Assessment (PRA).

#### Designated Sites

2.2 A biodiversity desk study was undertaken in relation to the site in September 2019. The sources consulted and the type of information obtained are summarised in Table 1.

Table 1 – Sources of biodiversity and ecological records.

Source	Information requested (search buffer from site centre/boundary)
Multi-Agency Geographic Information for the Countryside (MAGIC) <sup>1</sup>	International statutory designations (10km) National statutory designations (10km)

2.3 The search buffers are considered to be sufficient to cover the potential zone of influence (Zoi<sup>2</sup>) of the proposed development.

2.4 The impact of the proposed development on the biological integrity of any nearby designated protected sites has been fully considered.

### Bat activity surveys

2.5 Two bat activity surveys (dusk emergence survey and pre-dawn re-entry) were undertaken at the onsite buildings.

2.6 The dusk emergence survey commenced approximately 15 minutes before the time of local sunset (source [www.sunrisesunsetmap.com](http://www.sunrisesunsetmap.com)) and continued for approximately 1.5 hours after sunset.

2.7 The pre-dawn re-entry survey commenced approximately 1.5 hours before the time of local sunrise (source [www.sunrisesunsetmap.com](http://www.sunrisesunsetmap.com)) and continued for 15 minutes after.

2.8 Surveyors were equipped with broadband bat detectors (Elekon BatScanner Stereo). Elekon Batloggers was also deployed to record bat activity across the site.

2.9 Note was made of all bat activity recorded including (where appropriate) roost access points, species, time of re-entry, direction of flight, behaviour (foraging or commuting) and use of landscape features. Minimal lighting was used during the surveys as this can alter the behaviour of the bats emerging from or entering a roost, or foraging or commuting over a site.

### Surveyor information

2.10 The activity surveys were led by Jessica with assistance. See Table 1 for further information.

<sup>1</sup> <http://magic.defra.gov.uk/MagicMap.aspx>

<sup>2</sup> Zoi definition – ‘the areas/resources that may be affected by the biophysical changes caused by activities associated with a project’ (CIEEM, 2016).

Table 2 – Surveyor information.

Surveyor	Licences	Ecological experience
Richard Dodd B.Sc. (Hons.), CEcol, MCIEEM Principal Ecologist	Bat Dormouse GCN	A Chartered Ecologist with over 10 years of project management experience across the public, private and voluntary sectors. An experienced and licensed bat ecologist and holds additional licences for dormouse and great crested newt surveying and mitigation.
Peter Hacker M.Sc., B.Sc. (Hons), Grad CIEEM Assistant Ecologist	-	Holds a 2:1 Honours degree in Ecological Consultancy. Has field experience gained through both academic and professional training. Experience of surveying a range of protected species including reptiles, bats, great crested newt, and common dormice.
Jessica Snow M.Sc., B.Sc. (Hons) Assistant Ecologist	GCN	Holds a 2:1 Honours degree in Zoology and a Masters in Global Wildlife Health and Conservation. Gained professional experience working with ecological consultancies since 2018. Practised in undertaking a range of protected species surveys including great crested newts, reptiles and bats.
Survey assistants Ian Weller Hazel Cook	-	All survey assistants received training in use of bat detectors and survey methodologies. Deemed competent and confident to use bat detectors to observe bats in flight and conduct an emergence/re-entry survey in conjunction with a licenced ecologist. Assistants backed up by experienced surveyors and/or recording detectors where possible.

Limitations and assumptions

- 2.11 A roost for myotis sp was identified during the surveys and calls recorded during the surveys. It is not possible to confidently produce identification to a species level from sonogram alone. The proposed development is unlikely to have a high impact on the habitats or species at a local level so identification to a genus level should be sufficient to inform the impact assessment and any mitigation strategy.
- 2.12 No limitations were encountered or assumptions made and it is considered that, with the access gained and recording undertaken, an accurate assessment of the site’s ecological value was made.

### 3 RESULTS

#### Desk study

##### Previous survey information

3.1 Focus Ecology Ltd was commissioned by the client to undertake a Preliminary Roost Assessment (PRA) on 6<sup>th</sup> June 2019.

3.2 The results of the PRA are summarised in Table 3.

Table 3 - Previous survey results

Building Reference	Internal and external Potential Roost Features (PRFs) & access points	Classification
Barn 1	<ul style="list-style-type: none"> <li>- Occasional gaps between corrugate metal roof sheets</li> <li>- Linear gap above the doorway, no bat related activity observed under endoscopic inspection</li> <li>- Brick work in good condition, no areas of missing mortar/damage observed</li> <li>- Internal area very light due to the presence of windows</li> <li>- No potential roosting features or bats were identified and no signs of bat related activity</li> </ul>	Negligible
Barn 2	<ul style="list-style-type: none"> <li>- Several gaps were observed in the external stonework which may provide a niche for roosting bats</li> <li>- Many gaps were observed in the internal stonework and at the wall tops</li> <li>- A ridge tile is missing from the roof and gaps were observed under several of the other ridge tiles</li> <li>- Access at the eaves to the wall tops of the barn Several bat droppings were recorded on the floor of the mezzanine level</li> <li>- Approx. 100 fresh bat droppings were recorded in the attached privy outbuilding located on the north elevation, suggesting the presence of a night roost</li> </ul>	Moderate suitability
Barn 3	<ul style="list-style-type: none"> <li>- A large crack in the stonework on the eastern gable end wall which may provide an opportunity for roosting bats</li> <li>- Several gaps seen under the tiles</li> <li>- Several missing windows providing direct access, area very light due to the presence of windows</li> <li>- Occasional gaps in the internal brick work</li> <li>- Tiles are viable due to the absence of bitumen underfelt</li> <li>- A couple of bat droppings were recorded</li> </ul>	Moderate suitability

3.3 Further surveys were recommended to confirm presence/absence of roosting bats at Barn 2 & 3, the species, level of activity and roost characterisation. A minimum of two dusk or dawn surveys completed by at least four surveyors (two per barn)

#### Designated sites

3.4 There were two international statutory designations and eight national statutory designations within 10km of the site designated for their bat populations (see Table 4). See Appendix II for a map displaying the location of SAC and SSSIs in relation to the site.

Table 4 – Summary of designated sites in range of the site.

Site name	Designation	Description / key reason for designation	Distance & direction
Wye Valley and Forest of Dean Bat Sites	SAC	Straddling the Welsh/English Border, it is made up of thirteen component SSSIs. The deciduous woodlands and sheltered valleys of the Forest of Dean and the Wye Valley provide a good feeding area, and the underground systems provide roosting and breeding sites. The complex of sites contains the greatest concentration of lesser horseshoe bats, approx. 26% of the UK population. Selected due to the exceptional breeding population with the majority of sites being maternity roosts. The bats are believed to hibernate in many of the disused mines in the area. Also, represents approx. 6% of the greater horseshoe bat population including the main maternity roost and they are believed to hibernate in many of the disused mines.	Closest SSSI 2.6km east
Westbury Brook Ironstone Mine	SSSI	One of a series of SSSI within the Forest of Dean and Wye Valley SAC. A recorded hibernation site for both Lesser and Greater Horseshoe bats. The entrances to the site, which are at Scowles, are gated and grilled to protect the bats from interference.	2.6 km east
Wigpool Ironstone Mine	SSSI	One of a series of SSSI within the Forest of Dean and Wye Valley SAC. The mine is recorded hibernation site for both lesser and greater horseshoe bats, the entrances to the site are gated and grilled to protect the bats from interference.	2.6 km north east
River Wye	SSSI	The bankside trees provide valuable feeding and roosting habitats for several bat species including the greater horseshoe and Daubenton's bat.	3.2 km west
Buckshraft Mine & Bradley Hill Railway Tunnel	SSSI	One of a series of SSSI within the Forest of Dean and Wye Valley SAC. The mine is a very important hibernation location for greater horseshoe bats. Bats come from nearby Dean Hall SSSI and Cellar SSSI as well as Woodchester Park SSSI, 15km away. The mine systems and dis-used tunnel offer a range of micro-climates sought by hibernating and roosting bats. The woodlands also provide feeding habitats for the bats and are important in ensuring a readily available food source of insects.	5.6 km south
Wye Valley Woodlands	SAC	A cross border site comprising sixteen SSSIs. Covered by at least 90% semi-natural broadleaved woodland. Lesser horseshoe bat is listed as a species present as a qualifying feature, but not a primary reason for site selection. They use the woodland for foraging during the breeding period.	5.7 km west
Upper Wye Gorge	SSSI	One of a series of SSSI within the Forest of Dean and Wye Valley SAC. The woodlands of the lower Wye Valley form one of the most important areas for woodland conservation in Britain. Greater and lesser horseshoe bats	5.7 km west

		use a series of caves and mines within the site as a winter roost.	
Dean Hall Coach House & Cellar	SSSI	One of a series of SSSI within the Forest of Dean and Wye Valley SAC. Notified as an important breeding roost for the nationally rare greater horseshoe bat. Use of this site has been recorded since 1986, although local reports suggest that bats may have used the buildings for over 75 years, making it a very long-established roost.	5.8km south east
Lady Park Wood	NNR	Forms part of the Wye Valley Woodland SAC. A variety of rare bats have been recorded in the NNR, in particular greater and lesser horseshoe bats which are found here in significant numbers.	8.7 km south west
Old Bow and Old Ham Mines	SSSI	One of a series of SSSI within the Forest of Dean and Wye Valley SAC. The site supports a nationally important hibernation roost site regularly holding more than 300 lesser horseshoe bats. The vast size and depth of the systems provide the wide range of underground microclimates required by the bats. Other species which use the hibernacula include Daubenton's bat, Brandt's bat, Natterer's bat, whiskered bat and long-eared bats which make use of the many crevices and rock piles throughout the system.	9.8 km south

#### Links to the surrounding habitat

- 3.5 There are several ponds in the vicinity of the site, and Drybrook Quarry 600m north east which is surrounded by an area of woodland.
- 3.6 There is minimal direct links to the wider landscape. However, the site is in a rural location surrounded by connected woodland block and agricultural land connected via mature hedgerows.
- 3.7 There is an absence of night lighting across the site and no street lights present on the road along the south of the site.
- 3.8 The site is well connected to the wider landscape that is of continuous, high-quality habitat of ecological value that is likely to be used regularly for a range of foraging, commuting and roosting bat species.

#### Bat activity surveys

##### Timing and conditions

3.9 The survey timings and weather conditions during the activity surveys can be seen in Table 5.

Table 5 – Summary of survey timing and conditions.

Date	Type	Survey Timing			Conditions			
		Start	End	Sunset / Sunrise	Temp [°C]	Cloud Cover [Oktas]	Wind Speed [Beaufort]	Rain
29/08/2019	Pre-dawn re-entry	04:47	06:32	06:17	Start: 10 End: 8	Start: 0 End: 0	Start: 0 End: 0	Nil
11/09/2019	Dusk emergence	19:20	21:05	19:35	Start: 17 End: 16	Start: 4 End: 7	Start: 2 End: 1	Nil

3.10 The results of the bat activity surveys are summarised in Table 6.

Table 6 – Bat activity survey results. SS/SR±xx refers to the time in minutes before/after sunset/sunrise.

Survey type and date	Roosts / points of particular interest	General observations	Equipment Used	Surveyors (licenced*)
Pre-dawn re-entry 29/08/2019	Last bat heard at SR-49 was a common pipistrelle Re-entry: 1x myotis sp at SR-77 into open window of barn 3 Lesser horseshoe bat was observed flying in a south direction pass barn 3	Bat species recorded/observed: common pipistrelle, myotis sp, lesser horseshoe Small number of commuting and foraging passes	2x Elekon Batlogger M 3x Elekon Batscanner	Richard Dodd* Peter Hacker Jessica Snow Ian Weller
Dusk emergence 11/09/2019	First bat heard at SS+24 was a non-echolocating bat emerging from barn 2 Emergence: 5x common pipistrelle between SS+25 and SS+35 from west gable end of barn 3 Emergence: 2x myotis sp at SS+30 from open window of barn 3 Emergence: 1x common pipistrelle at SS+25 from open window of barn 3 Emergence: 2x common pipistrelle at SS+24 & SS+30 from east gable end of barn 2 Re-entry: 2x common pipistrelle at SS+74 & SS+ from open window of barn 3	A small number of bat droppings collected from barn 2 prior to survey indicative of lesser horseshoe Bat species recorded/observed: common pipistrelle, myotis sp, lesser horseshoe Lesser horseshoe observed flying between barns 2 and 3 then commuting north Common pipistrelle commuting and foraging along west elevation of barn 3, between barns 2 & 3 and along north elevation of barn 2	2x Elekon Batlogger M 2x Elekon Batscanner	Peter Hacker Jessica Snow Ian Weller Hazel Cook

3.11 Access point locations and bat flight lines can be seen in Appendix III.

3.12 Bat roosts were identified during the activity surveys and are summarised in Table 7.

Table 7 - Details of bat roosts identified.

Date	Species	Number	Roost type	Structure reference	Roost location / Access points	Dimensions or description
29/08/2019	Myotis sp	1	Day roost	Barn 3	Open window on south elevation	
11/09/2019	Myotis sp	2	Day roost	Barn 3	Open window on south elevation	
11/09/2019	Common pipistrelle	2	Day roost	Barn 2	East gable end Ventilation hole	
11/09/2019	Common pipistrelle	5	Day roost	Barn 3	West gable end gap in stonework on north elevation	
11/09/2019	Common pipistrelle	2	Day roost	Barn 3	West gable end gap in stonework on north elevation	
11/09/2019	Common pipistrelle	2	Night roost	Barn 3	Open window on south elevation	

11/09/2019	Lesser horseshoe	Small number	Night roost	Barn 2	Outbuilding privy on north elevation	
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3.13 The results from the loggers deployed can be seen in Table 8.

Table 8 – Results of the Batloggers.

Date	Species	Location	# of recordings	# of calls
29/08/2019 Dawn Survey	Common pipistrelle	Between barns 2 & 3	7	99
	Myotis sp		5	20
	Lesser horseshoe		5	75
11/09/2019 Dusk Survey	Common pipistrelle	Between barn 2 & 3	96	2121
	Myotis sp		11	171
	Lesser horseshoe		2	20
	Noctule		6	26
	Soprano pipistrelle		8	69
	Common pipistrelle	South of barn 3	97	1431
	Myotis sp		14	164
	Lesser horseshoe		9	88
	Noctule		6	22
Soprano pipistrelle	7	71		

## 4 INTERPRETATION AND ASSESSMENT

- 4.1 The following interpretation and assessment is provided to ensure full compliance with both UK and European legislation and both local and national planning policy (see Appendix V).

### Designated sites

- 4.2 There were two international statutory designations and eight national statutory designations within 10km of the site designated for their bat populations (see Table 3). Lesser horseshoe and greater horseshoe bat species are the primary reason for the selection of the sites.
- 4.3 The Wye Valley and Forest of Dean Bat Sites only covers the major maternity and over-wintering roosts of lesser and greater horseshoe bat. The bats also depend on features outside the designated sites including intermediate roosts, foraging grounds and hedgerows/tree belts that the bats use as commuting routes. Impact on these features can also affect the integrity of the site.
- 4.4 Although the proposed development is within 10km buffer zone of the SAC, it is likely that the majority of developments will not be near enough to known bat sites to have significant effects. The closest SSSI, Westbury Brook Ironstone Mine, is located approximately 2.6km east of the site.
- 4.5 Given the scale of the proposed development, and the lack of likely impacts beyond the site boundary, the nearby designated sites are sufficiently well separated so that no impacts on their designated features are anticipated as a result of the works.

### Bat activity surveys

- 4.6 Bat roosts for three species were confirmed within the onsite building.

A day roost for myotis sp (X2) was confirmed in barn 3, with access via an open window on the south elevation. It is not possible to provide identification to a species level.

A day roost for common pipistrelle (X2) was confirmed in barn 2, with access via an air ventilation gap on the east gable end.

Two day roosts for common pipistrelle were confirmed in barn 3, with access via an open window on the south elevation (X2) and a gap in the stonework at the top of the wall on the west gable end towards the north elevation (X5)

A night roost for common pipistrelle (X2) was confirmed in barn 3, with re-entry via a gap in the stonework at the top of the wall on the west gable end towards the north elevation

A night roost for lesser horseshoe was confirmed in barn 2, bat droppings were observed during the PRA and activity surveys in the privy outbuilding

- 4.7 In barn 2 the day roost for common pipistrelle will be lost as a result of the proposed works. The night roost for lesser horseshoe will be retained.
- 4.8 In barn 3 the day roost for myotis sp, common pipistrelle and night roost for common pipistrelle will be lost as a result of the proposed works.

- 4.9 In the absence of mitigation, there will be a negative impact on roosting bat species as a result of the proposed development of the site. A European Protected Species licence (EPSL) for all species of bats roosting onsite will be required.
- 4.10 Five species of bat were and/or observed during the surveys using the site for commuting and foraging. The site is well connected to the wider landscape that is of continuous, high-quality habitat of ecological value that is likely to be used regularly for a range of foraging, commuting and roosting bat species.
- 4.11 An assessment was made of the value of all bat roosts identified onsite (plus the value of the site for commuting and foraging) using the framework suggested by Wray et al (2010) – see Table 9.

Table 9 – Value of the site for bats (from Wray et al 2010)

Site location	Ash Farm, Drybrook					
Type & complexity of linear features	Well-connected hedgerows and woodland edges (5)					
Foraging habitat characteristics	Mixed agricultural, small villages and woodland blocks (4)					
Species on site	Roost type	# of bats	Roosts/potential roosts nearby	Geographic frame of reference [score]		
				Roost	Commuting	Foraging
Myotis sp	Day roost	2	Potential	County	County (24)	County (23)
Common pipistrelle	Day roost	5	Potential	Local	County (21)	County (20)
Common pipistrelle	Day roost	2	Potential	Local	Local (16)	Local (15)
Common pipistrelle	Night roost	2	Potential	Local	Local (16)	Local (15)
Lesser horseshoe	Night roost	Small number	Potential	County	County (24)	County (23)

- 4.12 There are eight SSSIs within 10km of the site designated for their bat populations, encompassed by The Wye Valley and Forest of Dean Bat Sites SAC, the closest SSSI is located approximately 2.6km east of the site. Lesser horseshoe and greater horseshoe bat species are the primary reason for the selection of the site.
- 4.13 The site is located between Wye Valley & Forest of Dean Bat Sites (SAC) and Wye Valley Woodlands (SAC) and associated SSSIs. There is minimal direct links from the site to the protected areas, but due to its location is likely to be used as part of their commuting feature. It is unlikely lesser or greater horseshoe bat species use the site for foraging, due to the absence of suitable habitat features.
- 4.14 Infrequent passes by lesser horseshoe bat were recorded during the surveys. Lesser horseshoe bats are highly light adverse have been shown to move their flight paths which link their roosts and foraging grounds to avoid artificial light installed on their usual commuting route.
- 4.15 Artificial light levels are minimal onsite and within the vicinity, any new lighting as part of the proposed development will have a negative impact on bats due to light spillage, as it may disturb or disrupt existing bat flight paths and result in habitat fragmentation, impacting on local bat populations.

4.16 In the absence of mitigation, there will be a negative impact on commuting and foraging bat species due to any proposed additional lighting.

## 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Wildwood Ecology was commissioned by Ann Sullivan and Hazel Bullock (the client) to undertake roost characterisation activity surveys at Ash Farm, Drybrook.

5.2 The site is the subject of a planning application for the proposed conversion of the barns.

### Designated sites

5.3 Designated sites in the vicinity of the site (see Table 4) are sufficiently well separated so that no impacts on their designated features are anticipated as a result of the proposed development.

### Bat activity surveys

5.4 Bat roosts for common pipistrelle, myotis sp and lesser horseshoe bats were confirmed within the onsite buildings. In the absence of mitigation, there will be a negative impact on bat species as a result of the proposed development of the site.

5.5 Therefore, a European Protected Species mitigation licence (EPSML) for all species of bats roosting onsite will need to be obtained in order for the works to the buildings to be legally undertaken, should planning permission be granted. A detailed mitigation and compensation strategy will need to be devised in the form of a method statement, this will be required for planning permission and the EPSML application.

5.6 The method will aim to ensure that the maintenance of the known roosts and local bat populations are maintained at a favourable conservation status. It will include mitigation recommendations as follows:

5.7 Where possible the existing roosts should be retained and incorporated into the proposed development. Access into the buildings should be retained or created to allow continued use of the existing roosts.

5.8 The outdoor privy will be retained to allow continued use by lesser horse bat as a night roost.

5.9 Three bat boxes will be installed on the exterior walls of the converted barns. The boxes will be suitable for crevice dwelling bats, many designs are available, and we would initially suggest the following Schwedler 1FR or 1FF bat tube (or similar). These will be installed as high up as possible (no less than 5m from the ground level), out of direct light and with open access to bats. The bat boxes will be maintained in position for a minimum of five years.

5.10 The method statement will detail the appropriate timing for works to the buildings. This will be outside of the most vulnerable time periods for bats, April - October.

5.11 Only BS747 Type 1F bitumen roofing felt or wooden sarking will be used to line the roof. Breathable membranes will not be used as they are detrimental to the welfare of bats and when used in bat roosts are known to lose their functionality over time.

5.12 A licenced bat ecologist (ECoW) will be appointed a toolbox talk will be delivered to inform contractors that the site is a known bat roost. The ecologist will provide information on why bats are protected, where bats have been found, the legal implications associated with working around bats and a bat roost and what to do should bats be found (i.e., stop works immediately and contact the ecologist for advice).

- 5.13 Immediately after the induction, the barns will be subject to a visual survey by a licenced bat ecologist prior to works commencing and high risk works (those most likely to encounter or impact upon bats) will be overseen by a licenced bat ecologist.

#### Lighting

- 5.14 All UK bats are nocturnal species and light averse (horseshoe bats particularly so). Lighting in the vicinity of a bat roost causes disturbance and potential abandonment of the roost. In addition, the associated flightpath to and from the access point is just as valuable and vulnerable as the roost itself. Artificial lighting of foraging and commuting routes is known to act as a barrier to bats and fragment otherwise suitable habitats.
- 5.15 There will be no illumination of any roost entrances and associated flightpaths. There will be no additional artificial light introduced as part of the proposed development.
- 5.16 Therefore, if there is to be lighting, there will need to be a lighting plan demonstrating consideration for bats. Suggestions for achieving this and for mitigating the light impact on bats are outlined in Guidance Note 08/18 - 'Bats and artificial lighting in the UK; Bats and the built environment series' (The Bat Conservation Trust, BCT, and the Institution of Lighting Professionals, ILP).

#### Biodiversity enhancement

- 5.17 Local Authorities have a duty to seek to maintain and enhance biodiversity in the exercise of their functions.
- 5.18 Where possible the existing onsite habitat will be retained to ensure that species are not adversely affected by the development. Native species of local provenance will be used for any new planting on the site.
- 5.19 Bat roosting features (including integrated or external boxes), over and above that required for mitigation or compensation on this site should be installed. Bird boxes should be incorporated within any newly constructed buildings and boundary features. A range of types should be used in order to cover a variety of species.

#### Overall conclusion

- 5.20 Providing that the recommendations outlined within this report are successfully implemented and a full method statement is provided, it should be possible for the proposed development to proceed and for there to be no long-term impacts upon the key protected species present at the site.

<p>This ecological report will remain valid for a period of 12 months from the date of the last survey – i.e. until September 2020. Further surveys may be required to update the site information if planning is not obtained or works do not commence within that time period.</p>
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## 6 REFERENCES

- Bat Conservation Trust and the Institution of Lighting Professionals (2018) Bats and artificial lighting in the UK; Bats and the Built Environment series (Guidance Note 08/18), The Bat Conservation Trust, London.
- Collins, J. (ed.) (2016) Bat surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.
- Focus Ecology (2019) Preliminary Roost Assessment – Barns at Ash Farm, Morse Lane, Drybrook, GL17 9BE. Focus Ecology Ltd, Worcester
- Joint Nature Conservation Committee (2010). Handbook for Phase 1 habitat survey; A technique for environmental audit. Reprinted by JNCC, Peterborough.
- Mitchell-Jones, A.J. & McLeish, A.P. Ed., (2004) 3rd Edition Bat Workers' Manual. Joint Nature Conservation Committee, Peterborough.
- Mitchell-Jones, A.J. (2004) Bat Mitigation Guidelines. Natural England, Peterborough.
- Rowse E.G., Lewanzik D., Stone E.L., Harris S., Jones G. (2016) Dark Matters: The Effects of Artificial Lighting on Bats. In: Voigt C., Kingston T. (eds) Bats in the Anthropocene: Conservation of Bats in a Changing World. Springer, Cham.
- Wray, S., Wells, D., Long, E. & Mitchell-Jones, T. (2010) Valuing bats in ecological impact assessment. In Practice, No 70, Institute of Ecology and Environmental Management.

**APPENDIX I: SITE PLAN**





**APPENDIX III: SURVEY RESULTS**



Figure 2 – Showing access point locations

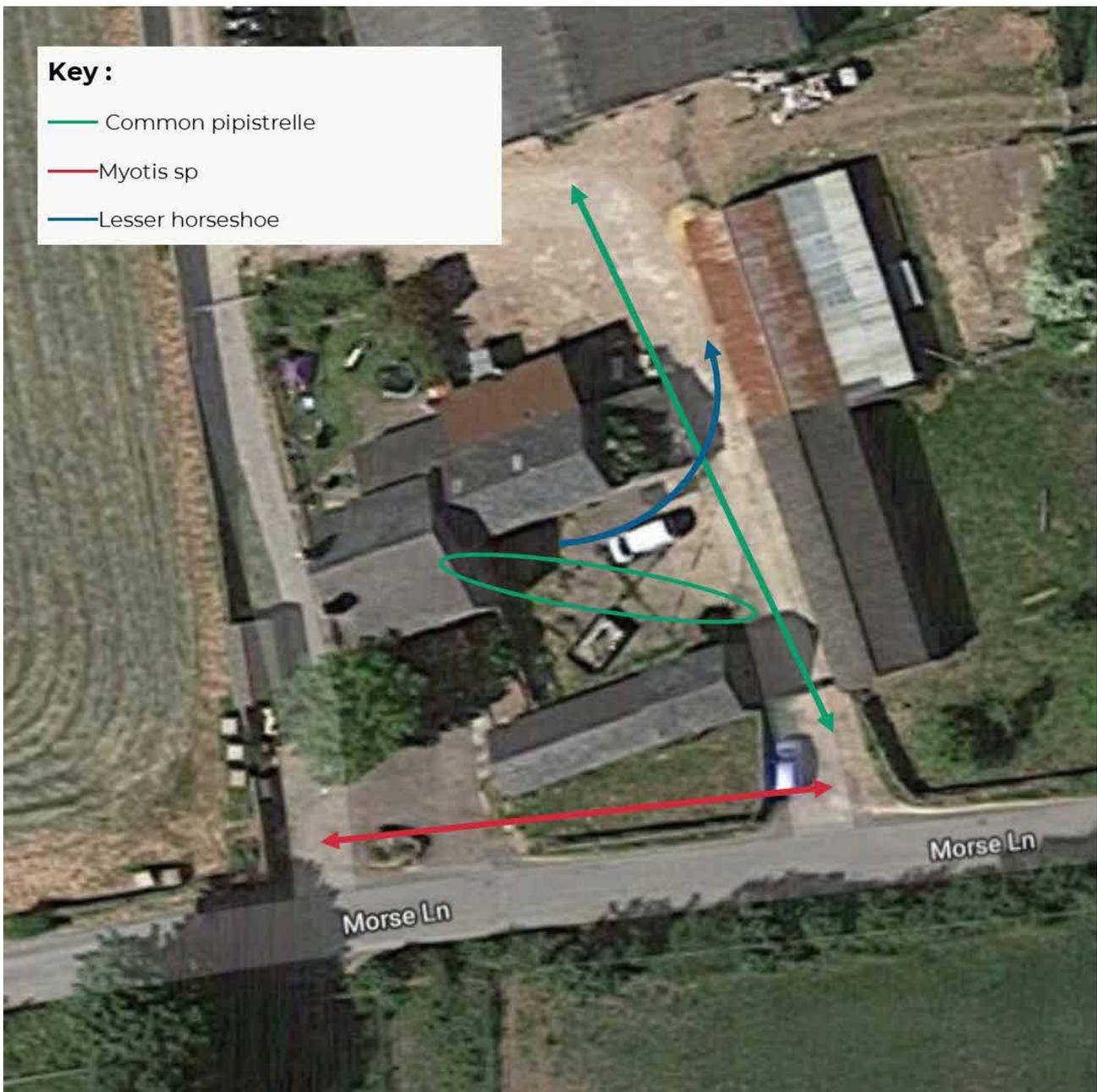


Figure 3- Displaying key flight paths identified



## APPENDIX V: SPECIES LIST

To be submitted to the appropriate Local Records Centre

Site Name: Ash Farm, Drybrook  
Grid ref: SO 634 175

Provided by: Wildwood Ecology  
Verified by: Jessica Snow

Common name	Scientific Name (if known)	Number	Comment
Common pipistrelle	<i>Pipistrellus pipistrellus</i>		Activity survey
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>		Activity survey
Myotis sp	Myotis sp		Activity survey
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>		Activity survey and droppings
Noctule	<i>Nyctalus noctula</i>		Detector recording

## **APPENDIX IV: PLANNING POLICY AND LEGISLATION**

The following local and national planning policy and both primary and European legislation relating to nature conservation and biodiversity status are considered of relevance to the current proposal.

### Planning and biodiversity

Local Authorities have a requirement to consider biodiversity and geological conservation issues when determining planning applications under the following planning policies.

#### National Planning Policy Framework 2019

The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019) states: "Planning policies and decisions should contribute to and enhance the natural and local environment by: protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; maintaining the character of the undeveloped coast, while improving public access to it where appropriate; minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

### Legislation and biodiversity

Certain species of animals and plants found in the wild in the UK are legally protected from being harmed or disturbed. These species are listed in the Wildlife and Countryside Act 1981 (as amended) or are named as European Protected Species (EPS) in the Conservation of Habitats and Species Regulations 2017 (as amended). These two main pieces of legislation have been consulted when writing this report and are therefore described in detail within this section.

Other relevant legislation and policy documents that have been consulted include – The Countryside and Rights of Way Act 2000; The Hedgerow Regulations 1997; Biodiversity Action Plans, both UK-wide (UKBAP) and Local plans (LBAPs), and The National Planning Policy Framework (NPPF).

There is also legislation that legally protects certain animals - for example, the Protection of Badgers Act (1992) protects badgers and their setts, and the Deer Act (1991) places restrictions on actions that can be taken against deer species.

#### Wildlife & Countryside Act 1981 (as amended)

The Wildlife & Countryside Act 1981 (as amended) [WCA] is the primary legislation for England and Wales for the protection of flora, fauna and the countryside. Part I within the Act deals with the protection of wildlife.

Most European Protected Species offences are now covered under the Conservation of Habitats and Species Regulations (see below), but some 'intentional' acts are still covered under the WCA, such as obstructing access to a bat roost.

The WCA prohibits the release to the wild of non-native animal species listed on Schedule 9 (e.g. Signal Crayfish and American Mink). It also prohibits planting in the wild of plants listed in Schedule 9 (e.g. Japanese Knotweed and *Rhododendron ponticum*) or otherwise deliberately causing them to grow in the wild. This is to prevent the release of invasive non-native species that could threaten our native wildlife.

The provisions relating to animals in the Act only apply to 'wild animals'; these are defined as those that are living wild or were living wild before being captured or killed. It does not apply to captive bred animals being held in captivity.

There are 'defences' provided by the WCA. These are cases where acts that would otherwise be prohibited by the legislation are permitted, such as the incidental result of a lawful operation which could not be reasonably avoided, or actions within the living areas of a dwelling house.

Licensing: certain prohibited actions under the Wildlife and Countryside Act may be undertaken under licence by the proper authority. For example scientific study that requires capturing or disturbing protected animals can be allowed by obtaining a licence – e.g. bat surveys.

Conservation of Habitats and Species Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2017 (as amended) (which are the principal means by which the EC Habitats Directive is transposed in England and Wales) update the legislation and consolidate all the many amendments which have been made to the Regulations since they were first made in 1994.

These regulations provide for the:

- protection of European Protected Species [EPS] (animals and plants listed in Annex IV Habitats Directive which are resident in the wild in Great Britain) including bats, dormice, great crested newts, and otters;

- designation and protection of domestic and European Sites - e.g. Site of Special Scientific Interest [SSSI] and Special Area of Conservation [SAC]; and

- adaptation of planning controls for the protection of such sites and species.

Public bodies (including the Local Planning Authority) have a duty to have regard to the requirements of the Habitats Directive in exercising their function – i.e. when determining a planning application.

There is no defence that an act was the incidental and unavoidable result of a lawful activity.

Licensing: it is possible for actions which would otherwise be an offence under the Regulations to be undertaken under licence issued by the proper authority. For example, where a European Protected Species has been identified and the development risks deliberately affecting an EPS, then a 'development licence' may be required.

### Species protection

The following protected species information is relevant to this report. Legislation is only discussed in relation to planning and development; other offences may exist.

#### Bats

All British bats are classed as European Protected Species and therefore receive protection under the Conservation of Habitats and Species Regulations 2010 (as amended), making it an offence *inter alia* to:

- Deliberately kill, injure or capture a bat;

- Deliberately disturb bats;

- Damage or destroy a breeding site or resting place of a bat.

In addition, all British bats are also listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) which contains further provisions making it an offence to intentionally or recklessly:

Obstruct access to any structure or place which any bat uses for shelter or protection; or  
Disturb any bat while occupying a structure or place which it uses for that purpose.

If proposed development work is likely to destroy or disturb bats or their roosts, then a licence will need to be obtained from Natural England, which would be subject to appropriate measures to safeguard bats.