Rockfield Farm
Undy
Monmouthshire
NP26 3EL

An Ecological Survey Report By:

Just MAMMALS Consultancy
Limited Liability Partnership

On Behalf Of:

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1 Executive Summary

1.1 Agricultural activity has ceased at Rockfield farm, on the edge of the community of Undy, and the land is to be developed for housing. The empty house, and the redundant farm outbuildings are due for demolition. A bat survey of the ten structures was carried out in the summer of 2014, which found no evidence for the presence of bat roosts within the buildings. As the validity of the 2014 survey data expired, a reappraisal of the farm buildings was undertaken in December 2018. Additional assessment was recommended for the house during the summer activity period of May to September 2019, and this report contains the findings of the original preliminary roost appraisal of December 2018 and is updated by the survey visits and two dusk observations of May 2019.

1.2 With the exception of the house, no evidence of bats was found internally, or on the exterior of the nine outbuildings (Barns 1 – 4, Machine Shed, Dutch Barn, Hen House, Stables and Garage). Of these nine structures, eight were assessed to have negligible potential to be used by bats for day roosting or hibernation purposes. In December 2018, the outbuildings remained in the same condition as when surveyed in 2014, when only light bat foraging activity was occurring: the presence of bat roosts was still assessed to be unlikely. One outbuilding, the semi-derelict Garage, was assessed to have low to moderate hibernation potential, and special recommendations were made concerning the timing of the removal of this structure, to avoid the bat hibernation period, and the potential for bats to be killed.

1.3 In December 2018, a small number of old bat droppings (4) were found in the loft space of the house. This building remained intact although recent new gaps had been created whilst testing the dwelling for the presence of asbestos. The evidence of the bat droppings was not conclusive as they were old and found scattered within the central part of the loft. To establish with greater certainty whether the house contained bat roosts, the winter scoping survey was followed up by two dusk bat emergence/activity observations in May 2019. No bats emerged, and it is concluded that the house is not a bat roost. The presence of the low number of bat droppings is however enigmatic, and is attributed to historic and brief opportunistic bat activity when the property was occupied.

1.4 Two stone arch recesses forming the rear (south-west) wall of the Garage were a feature of this building, and identified to offer potential for bats. The December 2018 survey report concluded that they offered possible hibernation usage and were likely to be attractive to lesser horseshoe bats. Recommendations were made for the summer demolition of this building, but when the recesses were examined in late May 2019, a single torpid lesser horseshoe was roosting in the eastern recess. The presence of this bat means the Garage is a summer day roost for this species, and the demolition of the Garage and destruction of the two arches will require a European Protected Species licence is issued by Natural Resources Wales before work commences which affects the bat roost. Work to dismantle the Garage cannot commence until such time as a licence is obtained. Details about licence process and a scheme of mitigation are provided in this report.

1.5 All bats are protected under the provisions of Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), whilst their roosting places are also protected under the provisions of the Conservation of Habitats and Species Regulations 2017. Bats are highly mobile and opportunistic animals: if a bat is found, then all work must stop and advice must be sought from Natural Resources Wales, or failing this, a licenced bat ecologist. If work continues without seeking advice, then this may constitute an offence under the Wildlife and Countryside Act 1981 (as amended).

1.6 Breeding bird activity was noted. Several common bird species were recorded at the site and recommendations for birds are made in this report including advice concerning the legal protection afforded to breeding birds.

2 Introduction

2.1 The site of Rockfield farm is to be cleared and re-developed for residential housing. Plans are being prepared for the site clearance work under demolition order DM/2018/01606 dated the 19th of October 2018.

2.2 Previous assessment for bats had been undertaken at the property in 2014, including day time appraisal and dusk emergence/activity observations, carried out by staff from the Just Mammals Consultancy LLP. No bats were found at that time, but because of the passage of time between

that survey and the intention to demolish the structures, it was deemed appropriate to carry out another day time visual assessment of the property and additional summer observations. The Just Mammals Consultancy LLP was again engaged to undertake these surveys. Details of the site location are given in Table 1 below.

Table 1: Survey Site Details

Address	Grid Reference	Altitude
Rockfield Farm, The Elms, Undy NP26 3EL	ST 4376 8770	13m Above Ordnance Datum

2.3 Objectives of the preliminary roost appraisal were to:

- determine if bats are present in, or have the potential to roost in the buildings;
- consider if there will be impacts on bats from the proposed demolition works;
- gather sufficient information to be able to make appropriate recommendations.

2.4 Additional summer survey visits in May 2019 with two dusk activity observations of the house, were conducted to establish with greater certainty the presence/likely absence of bats and their resting places.

3 Survey Team Experience

3.1 The lead surveyor and author of this report is Diane Morgan. Diane carried out the preliminary roost assessment assisted by Phoebe Williams, a Trainee Ecologist with the Just Mammals Consultancy LLP. Surveyors and support staff who carried out the dusk bat activity sessions and details of their experience and the bat equipment used is shown in Table 2 below.

Table 2: Survey Team Experience

Name/Position/Detector	Licences	Experience
Diane Morgan BA (Hons) ACIEEM Senior Ecologist (TE)	78057:OTH:CSAB:2018 expiry 31st January 2020	Licenced bat ecologist of 20 years with considerable experience of surveying built structures for bats. She has carried out ringing of Daubenton's bat as part of a multi-year project on the species and has undertaken monitoring work on several important lesser horseshoe bat roosts and assisted in radio tracking projects on the same species. She also holds a licence for ringing greater horseshoe. Prior to her work as a consultant ecologist, Diane was the Director of Brecknock Wildlife Trust and was involved in a wide range of nature conservation work including species and habitat protection and conservation land management. Other areas of interest include otter, dormice, water voles, reptiles, amphibians, fungi and crayfish. Diane is a Senior Ecologist with the Just Mammals Consultancy LLP, and an Associate Member of the Chartered Institute for Ecology and Environmental Management
Phoebe Williams BA (Hons) Trainee Ecologist (TE)		Phoebe is a Geography graduate from the University of Exeter, and a former trainee at Gwent Wildlife Trust. She has completed a Natural Talent training scheme, studying hemiptera (bugs), at the National Museum of Wales. Her practical experience includes survey work for dormice, botany, newts, reptiles, and invertebrates. She has also carried out practical habitat management work, and has gained public engagement experience whilst volunteering for the Trust, and is a Trainee Ecologist with the Just Mammals Consultancy LLP
Phil Morgan CEnv MCIEEM Principal Ecologist (TE)	78239a:OTH:CSAB:2018 expiry 31st January 2020	Over 35 years' experience of undertaking building, tree and cave surveys for all bat species. In addition he has undertaken foraging and flight line surveys using heterodyne and other echo-location equipment and in 1991 made a significant contribution to a Bristol University run project, which established the methodology used in the National Bat Monitoring Programme. Phil has also undertaken numerous radio tracking exercises on both lesser horseshoe and Daubenton's bats, and is licenced to train ecologists to work with bat species. He holds Natural Resources Wales (NRW) licence for other protected species including dormice, otter, and great crested newt. Phil is a Principal Ecologist with the Just Mammals Consultancy LLP, and is a Member of the Chartered Society for the Environment, as well as being a Member of the Chartered Institute for Ecology and Environmental Management
Nigel Isaksson Senior Survey Assistant (TE)	76041:OTH:CSAB:2017 expiry 30th June 2019	Senior Survey Assistant with eleven years' experience undertaking bat surveys, flight line observations, census counts. Nigel holds an NRW licence to disturb bats, and is also licenced to disturb dormice, and is a Senior Survey

		Assistant with the Just Mammals Consultancy LLP
James Hoskins Survey Assistant (TE)		James is an experienced Survey Assistant with the Just Mammals Consultancy LLP. He has five years survey experience with bats, observing both buildings and trees

Note: Detectors TE = Time expansion (Pettersson D-240X)

4 Survey Methodology

4.1 Assessment involved a day time visual assessment of the ten structures, both externally and internally, seeking signs of the presence of bats. External survey involved examining outer surfaces from the ground and looking for signs of bat presence, including bat faeces (droppings). A high-powered lamp and close focusing monocular were used to examine potential access and roosting areas. Any gaps or crevices were inspected as closely as possible. The context of the buildings within the surrounding landscape was also assessed.

4.2 Internal survey searched for bats or the remains of dead bats (including dead juveniles and babies, which might indicate the presence of a maternity site), and signs of bats including bat faeces (droppings) on floors, ledges, walls, stored items and other surfaces. The roof structures and loft voids were inspected. The ridge areas, which are a favoured roost location, were checked for live bats. Beneath this line, a careful search for droppings and insect parts was conducted. Urine staining, both on paintwork and window glass or staining on timbers caused by oil from bat fur were also searched for, as well as discarded fragments of insects such as moth wings.

4.3 Two dusk emergence/activity observations were undertaken by a team of two ecologists on each occasion. The surveyors were equipped with Pettersson D-240X machines. These devices are particularly sensitive and excellent at separating species which employ the middle range frequencies for foraging (45 – 55 kHz). They are therefore very good at identifying the different pipistrelle species (*Pipistrellus sp.*), and the different myotid bats* (*Myotis sp*.) (*myotid bat is a collective term used where the species could not be specifically identified beyond this broad group). The myotid group encompasses seven species of British bat including Alcathoe's (*Myotis alcathoe*); Bechstein's (*M. bechsteinii*); Brandt's (*M. brandtii*); Daubenton's (*M. daubentonii*); Mouse-eared (*M. myotis*); Natterer's (*M. nattereri*); and the whiskered bat (*M. mystacinus*).

4.4 The Pettersson D-240X machine can be used in heterodyne or time expansion modes and for the purposes of this survey, only the time expansion facility was used. The received signals were then recorded to Roland RO-5, recording devices for later analysis. The time expansion method is similar to making a high speed tape recording of a bat's ultrasonic call and then playing it back at a slower speed. Digital technology is used to make the recording and slow it down for play back. Since the signal is stretched out in time, it is possible to hear details of the sound not audible with other types of detector.

4.5 Time expansion is also the only technique which preserves all characteristics of the original signal, which makes time expanded signals ideal for sound analysis. In addition to the simple echo location calls which can be used for commuting, enabling the bat to find its way about, bats will also produce feeding 'buzzes' when foraging. These buzzes occur when the bat closes in on its prey and are a consequence of the Doppler Effect, which results in a feeding 'buzz' as the reflected signal shortens when the animal approaches its prey. Such buzzes are used to assess the importance of an area for foraging. The recorded echo-location calls are then interpreted using BatSound sound analysis software. By use of the software it is possible to separate the different species by analysis of the sonograms produced.

4.6 Nesting birds were also considered at the time of assessment, with the surveyor looking for signs of historic bird activity, nest remains, evidence of collections of bird dropping, feathers or any other indications of use by birds.

5 Site Description

5.1 A full site description is provided in the survey report of 2014. A summary of key features of the ten structures is shown below in Table 3. A site layout plan is provided in Figure 2 (see Appendix II), which shows the position of the farm buildings in relation to each other.

Table 3: Description of Site Buildings

Building	Description
House	Brick building with walls covered with cement render painted cream. A pitched timber frame roof covered with concrete tiles and lined with a bitumen lining membrane. Two brick chimneys

Barn 1	Modern, metal framed livestock shed with walls of concrete block and upright timber planking and corrugated iron panels. Asymmetrical pitched roof covered with corrugated cement fibre sheeting. Ivy at north-west corner
Barn 2	Former milking parlour: brick and concrete block walls with metal framed pitched roof covered with corrugated cement fibre sheeting. It contains a series of ground floor stables and a small mezzanine area. Internal links to Barn 3
Barn 3	Storage barn with walls of concrete block and corrugated iron sheeting with a pitched roof covered with corrugated cement fibre sheeting. Internally one large open space with internal links to Barn 2
Barn 4	A modern livestock shed very similar to Barn 1
Machine Shed	Attached to the east wall of Barn 4, this open-fronted structure has a timber frame and a mono pitch roof. End walls and the roof covering are corrugated tin
Dutch Barn	Open fronted barn with layer of old hay across the floor
Hen House	Small timber structure
Stables	Built in timber with a pitched roof covered with bitumen sheeting, containing two stable compartments
Garage	Partially collapsed: open fronted at north-east end, a timber framed structure with wall and roof of corrugated iron sheeting. South-west end wall set into a bank of earth is made of stone with two arched recess areas

6 Desktop Study and 2014 Survey Review

6.1 The bat survey in 2014 found no evidence for the presence of bat roosts. A small number of gaps were noted around the house roof, with gaps below lead flashing around the base of the chimney, and two missing roof tiles; but no emergence activity was noted in the dusk observations in July and August 2014. Elsewhere in the farm buildings, *circa* five bat droppings were found scattered inside Barn 2, which were attributed to foraging behaviour, which was recorded during the two observations. A small number of moth and butterfly remains were also found scattered inside Barn 2, but there was no sign of a bat feeding perch. This building had numerous open doorways and windows and an internal link to Barn 3. Bats were also seen to fly into and forage inside Barns 1 and 3. No emergence behaviour was noted from Barn 4, the Dutch barn, machine shed, hen house, stable or Garage.

6.2 No part of the site is within a statutory designated site of conservation value (e.g. a Site of Special Scientific Interest (SSSI); Special Area of Conservation (SAC); Special Protection Area (SPA); or National Nature Reserve (NNR)). A search within a buffer zone of 2km around the site revealed four SSSI's to be in the surrounding area: Gwent Levels – Magor and Undy, Gwent Levels – Redwick and Llandevenny, Magor Marsh are to the south of the site forming part of the Gwent Levels, a small sliver of Penhow Woodlands SSSI is within the 2km radius to the north-east of the site.

7 Survey Constraints

7.1 There were no particular constraints encountered during the internal/external survey of December 2018 or summer 2019. Full access was provided and achieved.

8 Survey Results

8.1 A Preliminary Roost Appraisal (PRA) visit was made to the site on Tuesday the 11th of December 2018 and this was followed with two site visits in May 2019. Table 4 below summarises the details of the conditions under which the survey was undertaken. Wind speeds shown employ the Beaufort scale.

Table 4: Summary of Survey Activity and Weather Conditions

Date	Survey Type	Timing	Weather Conditions
11/12/2018	Day time visual inspection (DM, PW)	09.50 – 12.30 hours Greenwich Mean Time (GMT)	Air temperature: 7°C Cloud cover: 8/8 oktas Wind speed: F2, light breeze Conditions: Dry
16/05/2019	Dusk emergence/activity observation (PM, JH)	20.35 – 22.00 hours British Summer Time (BST) (Sunset 20.58 hours)	Air temperature: 14°C – 10°C Cloud cover: 3/8 oktas Wind speed: F3, gentle breeze Conditions: Dry
29/05/2019	Dusk emergence/activity observation (DM, NI)	20.30 – 22.15 hours BST (Sunset 21.15 hours);	Air temperature: 14°C – 13.5°C Cloud cover: 8/8 oktas Wind speed: F5, fresh breeze/strong gusts Conditions: Dry, damp, rain earlier
Surveyors	Diane Morgan (DM), Phoebe Williams (PW) Phil Morgan (PM), Jim Hoskins (JH), Nigel Isaksson (NI)		

8.2 The PRA, in December 2018, commenced with an inspection of the House loft, which found no live bats, but four old bat droppings, on the floor of the roof space. They were small and

pipistrelle sized, and dispersed within the central part of the loft. All the bat droppings were crumbled to check they were indeed bat droppings, as mouse droppings were widespread on the floor of the loft. A large, inactive, wasp nest (*Vespula vulgaris*), was noted inside the loft, against the southern eaves close to the porch. The external inspection of the House revealed no evidence of bats, no bat droppings or staining – nothing to indicate the presence of a bat roost. However, as noted in 2014, features of the structure offer potential for bat access and roost locations. These include:

- gaps under lead flashing at the base of the western chimney;
- gaps around the ridge area of the roof;
- raised and missing roof tiles.

8.3 Holes created in the House wall, for the recent asbestos survey, have now added a series of additional access points, and roost opportunities for bats and other creatures. The House is assessed to offer a moderate level of potential for bats, and the four bat droppings indicate some presence but it is not clear what they might signify.

8.4 Internal and external inspections of the remaining nine outbuildings found live bats and no evidence for the presence of bats. With the exception of the Garage, all the buildings were assessed to offer negligible potential to be bat roosts. The eight structures (Barns 1 – 4, the Machine Shed, Dutch Barn, Hen House and Stables), do not contain the features which bats typically exploit for roosting purposes. The survey in summer 2014, noted that bats were flying into the open internal spaces of the barns for early evening foraging and this usage is likely to continue. Roosting behaviour in these eight outbuildings is considered unlikely.

8.5 A feature of the semi-derelict Garage is considered to have low to moderate hibernation potential for bats. The south-west end stone wall of the Garage which is set against an earth bank contains two arched recesses partially hidden behind a panel of corrugated iron. It is the sort of feature that lesser horseshoe bats (*Rhinolophus hipposideros*), will utilise during mild winter weather. Cavities in the stone work could also be used by other bat species as a hibernation location. A summary of the survey findings are presented in Table 5 below.

Table 5: Summary of Survey Findings December 2018

Building	Survey Results	Recommendations
House	Four old bat droppings in loft	Postpone demolition until additional ecological assessment can be completed. Two summer dusk observations for bats required in 2019
Barn 1	No evidence or features of interest	Demolish as planned in early 2019
Barn 2	No evidence or features of interest	Demolish as planned in early 2019
Barn 3	No evidence or features of interest	Demolish as planned in early 2019
Barn 4	No evidence or features of interest	Demolish as planned in early 2019
Machine Shed	No evidence or features of interest	Demolish as planned in early 2019
Dutch Barn	No evidence or features of interest	Demolish as planned in early 2019
Hen House	No evidence or features of interest	Demolish as planned in early 2019
Stables	No evidence or features of interest	Demolish as planned in early 2019
Garage	End wall built in stone against an earth bank: recessed arches and crevices in the stonework are features of hibernation potential	Low – moderate hibernation potential. Delay demolition to the active summer period of May 2019 onwards. Dismantle structure following a visual check of stone wall and arched recesses

8.6 The first dusk summer observation in 2019 was undertaken in suitable weather conditions on the 16th May. During the survey of the House, very light bat activity was heard around the House, with only two bats heard and recorded during the session. No bat was seen to emerge from the farmhouse, and nothing was heard to indicate any bat roosting behaviour at the building. Full details are shown in Appendix III in Table 7.

8.7 A robin (*Erithacus rubecula*) was seen to fly in and out of the ivy (*Hedera helix*) at the south-west corner area of the House suggesting a nest in this location. Agitated behaviour by a house sparrow (*Passer domesticus*) also suggests that this species has an active nest in the dense ivy on the central south side of the House.

8.8 Prior to the second summer dusk observation on the 29th May 2019, an inspection of the farm buildings was conducted to consider the possible presence of bats and nesting birds. The Dutch Barn, and Barn 4, have been dismantled and removed. Barns 1 – 3 have been stripped of roof coverings. The Hen House, Stables and Garage remain standing. Within the left hand (east) recess at the south end of the Garage a torpid single lesser horseshoe bat was observed to be roosting, hanging off the arched roof. It was photographed in torchlight without a camera flash. No other bat presence was noted around the barns and outbuildings. Two pairs of swallows are

nesting in the Barn 2, favouring the mid-section where the timber flooring of the mezzanine level above provides a ceiling over a ground floor store room. Doors and windows are open giving the birds access, and the roof coverings are removed so all other parts are open to the sky.

8.9 The dusk observation of the House in late May 2019 recorded light activity around the building with no bat seen to emerge and no behaviour suggesting a possible emergence. A small number of bats were recorded including noctule (*Nyctalus noctula*), common pipistrelle (*Pipistrellus pipistrellus*), and a myotid species, probably Natterer's bat. Full details are shown in Table 8 (see Appendix III).

9 Discussion and Conclusions

9.1 With regard to eight of the outbuildings at Rockfield farm referred to in this report as Barns 1 – 4, the Machine Shed, Dutch Barn, Hen House, and Stables, the outcome of the December 2018 ecological assessment concluded that the proposed demolition of these structures could proceed as planned in early 2019. No evidence for the presence of bats was found and these buildings do not contain the sort of features which bats typically seek for their summer roosts or hibernation locations. These buildings offer negligible potential and are unchanged from 2014 when they were previously examined. When returning to the site in May 2019 it was noted that the Dutch Barn and Barn 4 with the attached open fronted Machine Shed had been dismantled and removed. Barns 1 – 3 had been stripped of roof coverings and are now open and exposed to the elements, except for one ground floor room where the mezzanine level above leaves a ceiling of timber floorboards.

9.2 The House was assessed to offer a moderate level of potential, due to gaps around the roof structure and the features and materials of the roof. In accordance with national guidelines, additional assessment has been carried out which found no evidence for roosting bats. A full assessment has been conducted and it is now concluded that the House is not a bat roost. The presence of the low number of bat droppings remains somewhat enigmatic and they are attributed to some historic and brief exploratory presence.

9.3 During the visit in late May 2019, it was established that the semi-derelict Garage is a bat roost, as evidenced by the presence of a single lesser horseshoe bat. This building was originally assessed to have low to moderate potential to be used by hibernating bats. The stone wall against the earth bank at the south-west end contains two arched recesses. These sorts of features are used by hibernating lesser horseshoe bats and crevices in the stone work have the potential to conceal other bat species. Without dismantling this feature, it is impossible to know if bats are present, and therefore a precautionary approach was recommended so that this feature be opened up and dismantled outside of the hibernation period.

9.4 However, the inspection of this feature in late May 2019 identified a summer day roost of a single lesser horseshoe bat. The lack of any obvious quantity of bat droppings within the recess suggests this feature is an occasional day roost. Lesser horseshoe bat is classed as rare and endangered, but south-east Wales supports a nationally important population. These bats will exploit roosting opportunities in sheds and outbuildings where there is access, for day roosting and night roosting by low numbers of animals likely to be males and non-breeding females. The presence of this bat means that the destruction of the semi-derelict Garage and the arched recesses will result in the destruction of a bat roost.

9.5 A European Protected Species (EPS) licence will be required from Natural Resources Wales (NRW), before any work is done which affects roosts and obstructs the bat exit/entry points. Further information concerning the EPS licence and other recommendations are made below. A scheme of mitigation is provided below which describes the provision of a night roost feature tested by the Vincent Wildlife Trust on Cathedine Common near Llangors Lake, and it is therefore referred to as the Cathedine night roost design.

9.6 For the demolition and re-development proposals to proceed, a robust scheme of mitigation is required to ensure that the favourable conservation status of the bat species is not adversely affected. The following broad principles must be followed within any scheme of mitigation of compensation at the site and will need to be delivered under the auspices of an EPS licence:

- bats must not be left without a place to roost;
- major works must be timed to avoid periods of the year when bats are likely to be present;
- any new roost structures provided as part of mitigation and compensation proposals must

be suitable for the species of bat and type of roost affected by the development;
- any scheme must ensure that the 'action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range', and;
- post-development monitoring is usually required to establish the effectiveness of the mitigation provision and can form part of the licence conditions and planning conditions if appropriate.

9.7 The bat(s) must not be left without alternative roost opportunities at the development site. Timing of the building demolition work will be important to ensure that a new night roost feature is available to the lesser horseshoe bat(s), before demolition occurs (see recommendations below).

9.8 A suitable location for the mitigation roost must be identified which considers issues of connective habitat and also the issue of artificial lighting. Lesser horseshoe bats are extremely sensitive and averse to well illuminated areas. A Bat Conservation Trust study of the impacts of lighting on bats has considered the increased risk of the bats being preyed on in well illuminated areas. Lighting was found to be harmful when present near woodland edges and hedgerows. Inappropriate lighting can result in the isolation of bat colonies and can affect insect behaviour which then adversely affects bats. Therefore issues relating to lighting are addressed in the recommendations below.

9.9 Agitated activity by a robin and house sparrow which was observed during the dusk observation sessions suggests that these two bird species have active nests in the dense ivy on the House. The robin nest is in the ivy near the south-west corner area, and the house sparrow activity was noted in the ivy, on the central south side area. In addition, two pairs of swallows are flying in and out of the mid-section of the barn 2 which contains the old milking parlour. One room retains a timber floorboard ceiling and old and active nests are present around the upper wall parts. House sparrow is included on the red list and swallow is listed on the amber list of the British Trust for Ornithology listing of Birds of Conservation Concern. Breeding birds must also be taken into account. All breeding efforts by birds are protected under the provisions of Part 1 of the Wildlife and Countryside Act 1981 (as amended) and guidance is provided below and also recommendations on mitigation and enhancements for birds.

10 Recommendations

10.1 All bats are protected under the provisions of Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), whilst their roosting places are also protected under the provisions of the Conservation of Habitats and Species Regulations 2017. Following the targeted bat surveys at Rockfield Farm, Undy, only the semi-derelict Garage has been identified as a bat roost. The proposed demolition of the remaining structures can proceed subject to consideration for nesting birds and special care concerning the removal of dense ivy, which is described below. However, being highly mobile and opportunistic animals, if a bat is found, then all work must stop and advice must be sought from NRW, or failing this, a licenced bat ecologist. If work continues without seeking advice, then this may constitute an offence under the Wildlife and Countryside Act 1981 (as amended).

10.2 Dense ivy vegetation must be removed with careful consideration for the possible presence of protected species such as bats or nesting birds. No ivy is to be taken down during the recognised bird breeding season of March to August inclusive. A visual check must be made at the commencement of the work to ensure no late nesting activity is occurring. The removed vegetation must be left on the ground for at least 24 hours prior to chipping, burning or removal from site in order to enable any wildlife not detected to relocate itself.

10.3 With regard to the Garage building only, which is a bat roost, an EPS licence application for the dismantling/ demolition of the building must be made to NRW. Under the Conservation of Habitats and Species Regulations 2017 an EPS licence can only be issued if NRW are satisfied that:
- there are imperative reasons of overriding public interest including those of a social or economic nature;
- there is no satisfactory alternative, and;
- the action authorised will not be detrimental to the maintenance of the population of the species at a favourable conservation status in their natural range.

10.4 As the Garage is a semi-derelict structure at risk of causing injury to site operatives it is

suggested that the EPS licence application is made on the ground of health and safety considerations. If not assessed under the approach, an EPS licence can only be obtained for development activity once full planning consent is granted, and there are imperative reasons of overriding public interest including those of a social or economic nature as indicated above. It can take several weeks to put together the necessary documents which include the licence application forms; a detailed Ecological Method Statement (EMS) (providing information on the survey effort with recent survey data not older than 18 – 24 months), and details of the local status of the species concerned; the duties of an independent experienced Ecological Clerk of Works (ECW); as well as the duties and responsibilities of the various contractors (e.g. builders, carpenters, electricians, plumbers etc); and the owner/developer of the site. A local planning authority consultation document must also be completed and signed, and any pre-commencement conditions concerning ecology must be formally approved and signed off by the planning authority. NRW do not currently make a charge for issuing an EPS licence but this circumstance is likely to change in the future.

10.5 This report proposes a scheme of mitigation based on the installation of a single stand-alone roost structure to be provided, in a suitable location, within the ownership of the owner/developer. The structure, which is designed by the Vincent Wildlife Trust, and proven to meet day and night roosting needs of lesser horseshoes is considered to be the optimum way to proceed given that a large area is to be developed for a housing scheme. A location must be identified on the edge of the development which offers features of connective habitat and naturally dark spaces. One such location is likely to be the retained woodland bank a short distance to the west of the farmstead and a secure location must be identified on the fringe of the natural habitat.

10.6 A replacement and permanent bat roost feature for lesser horseshoes is recommended to be created at the site. As stated, this feature is based on the design of the Vincent Wildlife Trust's Cathedine Night Roost (see Appendix VI: Figure 3). This small structure was field-tested at Cathedine Common, near Brecon and it was demonstrated to be effective with usage by lesser horseshoe bats occurring within a matter of weeks. Day and night roosting is recorded. The design must be followed in terms of dimensions and materials as a smaller structure will not provide sufficient internal volume, and it is important that the construction materials are bat friendly in terms of the timber used and the use of a traditional bitumen roof lining. Over future years, minor maintenance is likely to be necessary to maintain a weatherproof roof.

10.7 The location of the mitigation bat roost must be arranged with particular consideration for external lighting, and also close connective habitat. Lesser horseshoe bats are particularly averse to artificial lighting, and therefore the flight line to the opening, and the opening itself, must remain naturally dark environments. There must be no light spill from the new development or street lighting. As these bats avoid flying in large open spaces and typically fly close to the cover of protective habitat or built structures, it is important that connective habitat is in close proximity with uncluttered flight lines for bats to access the opening into the new night roost structure.

10.8 Timing of the demolition operations must also be considered as the bats must not be left without alternative roosting opportunities. The new roost structure must be installed and available to the bats before the Garage is demolished. As the stone recesses are identified to offer hibernation potential for other bat species, the winter period of November to March inclusive, must be avoided. Disturbance of bats in the summer period is not so damaging and potentially life threatening as disturbance in the winter period: in winter body reserves needed to sustain the bat must be saved until the spring weather and foraging opportunities come around.

10.9 Use of bat friendly materials must be part of the design for the mitigation bat roost. Consideration of materials concern timber treatment products to ensure no chemicals harmful to bats are applied to the new night roost.

10.10 To maintain connective habitat around the new bat roost structure, it may be necessary to modify the landscaping scheme of the new housing development. If this is required, a small scale planting regime of native hedgerow species must be carried out. This is to avoid large open gaps existing beyond the site of the bat mitigation structure. Suggested species for a native mix planting are shown below in Table 6.

Table 6: Suggested Species for Hedgerow Planting

Common Name	Scientific Name
Hawthorn	*Crataegus monogyna*
Blackthorn	*Prunus spinosa*
Hazel	*Corylus avellana*

Holly	*Ilex aquifolium*
Elder	*Sambucus nigra*
Dogwood	*Cornus sanguinea*
Honeysuckle	*Lonicera sp*

10.11 The location identified for the bat mitigation feature must consider the potential impacts of artificial lighting. Inappropriate lighting will affect bat behaviour and negate the provision of the mitigation structure. There must be no external light spill onto areas where the bat mitigation roost is located and linking dark corridors must be present if bats are to make use of the structure.

10.12 Post-development monitoring is usually required when an EPS licence is issued so as to ascertain the effectiveness (or otherwise) of the mitigation features. At this site, a single post development monitoring visit is recommended in year 1 following installation due to the low risk of affecting the conservation status of the bats. The monitoring will establish if the structure remains in-situ.

10.13 Bats can be encountered unexpectedly during building/demolition work, and if this occurs, it is important to stop activity in the vicinity of the bat(s). It is possible that a bat will be in a torpid state and unable to fly off for several minutes or even up to 20 minutes. Advice must be sought from NRW, or if this is not possible, then from a bat ecologist who holds a licence to disturb bats. To proceed without taking advice would be an offence under the provisions of the Wildlife and Countryside Act 1981 (as amended).

10.14 Breeding birds are protected under the provisions of the Wildlife and Countryside Act 1981 (as amended), and active bird nests cannot legally be disturbed or destroyed. Once a nest is established, the birds must be able to have access at all times until the young have fledged and the nest is no longer active. The bird breeding season commences as early as March for some species and continues to late August for species which rear a second or third brood. If an active nest is found, it must be retained and protected from disturbance. A cordon must be established for a safe working zone a suitable distance from the nest site, and not until the chicks have fledged can the nest be destroyed and the cordon taken down. Mitigation provision for nesting birds must be provided within the detailed plans for the new housing development with features suitable for garden birds, farmland birds and birds such as swallows and house martins. A minimum of 6 artificial nests must be provided in suitable locations avoiding predation by cats, and where there is protective cover for swallows.

11 References

Collins, J. (Ed.) (2016). '*Bat Surveys for Professional Ecologists – Good Practice Guidelines, 3rd Edition.*' Bat Conservation Trust, London

Institution of Lighting Professionals and Bat Conservation Trust. (2018). '*Bats and Artificial Lighting in the UK: Guidance Note 08/18*'. ILP, Rugby

Mitchell-Jones, A.J. (2004). '*Bat Mitigation Guidelines*'. English Nature, Peterborough

Mitchell-Jones A.J. and McLeish A.P. (2004). '*The Bat Workers Manual, 3rd Edition*'. English Nature, Peterborough

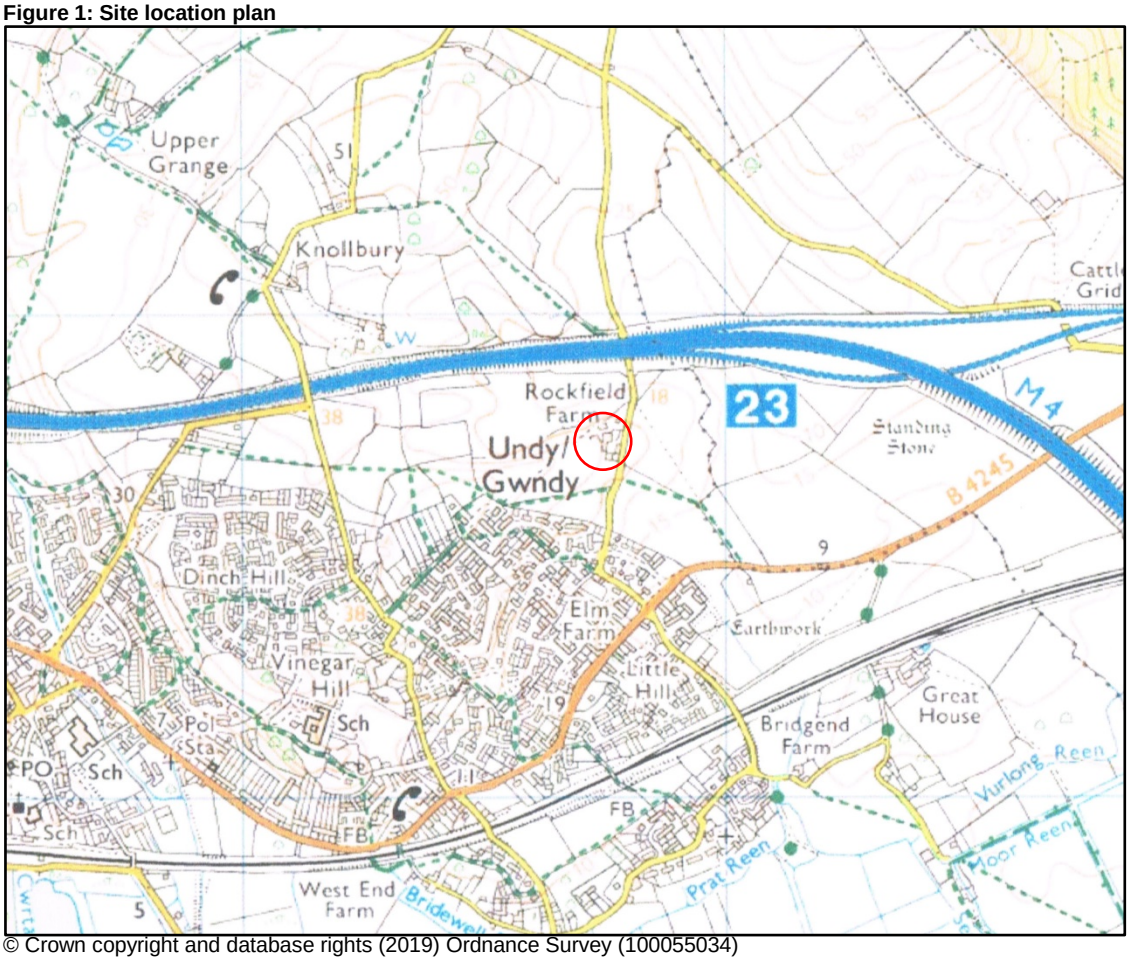
Russ, J. (2012). '*British Bat Calls: A Guide to Species Identification*'. Pelagic Publishing, Exeter

Schofield, H. (2008). '*The Lesser Horseshoe Bat – Conservation Handbook*'. The Vincent Wildlife Trust, Ledbury

The Vincent Wildlife Trust (2014). '*The Cathedine Night Roost*'. The Vincent Wildlife Trust, Ledbury

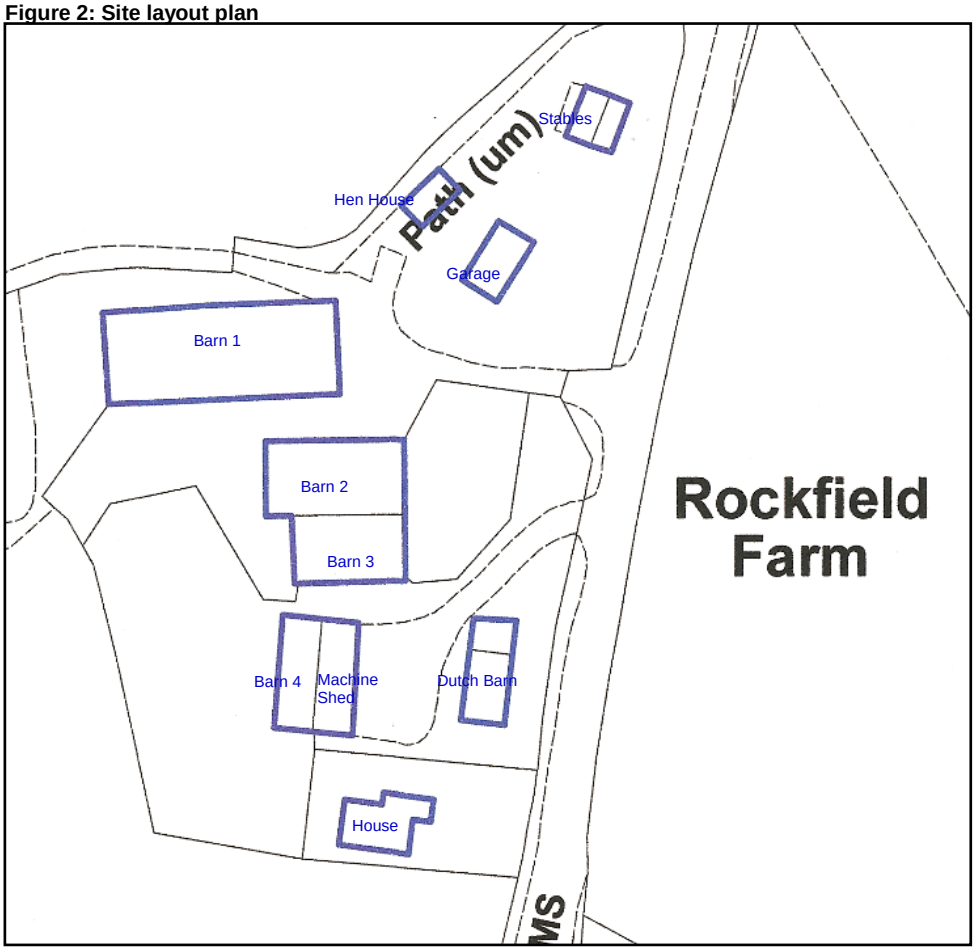
Appendix I: Site Location Plan

Figure 1: Site location plan



Appendix II: Site Layout Plan

Figure 2: Site layout plan



Appendix III: Results of Bat Activity Observations in 2019

Table 7: Rockfield Farm House, Undy – Dusk Observation 16th May 2019

Time (24 Hour Clock)	Species (Common Name)	Recording No.	Observed Activity
21.28 hours	Common pipistrelle (plus possible faint soprano pipistrelle in background)	1 PM	Heard but not seen – behind observer on south side of house
21.33 hours	Common pipistrelle	1 JH	Brief forage over yard on north side of House

Note: Highlighted records indicate emergence or re-entry activity

Table 8: Rockfield Farm House, Undy – Dusk Observation 29th May 2019

Time (24 Hour Clock)	Species (Common Name)	Recording No.	Observed Activity
21.37 hours	Noctule	1 DM	Heard but not seen
21.47 hours	Common pipistrelle	1NI, 2 DM	Flew from north to south past west end wall of House
21.50 hours	Myotid sp. – probable Natterer's	2 NI	Seen flying past garden boundary hedge on north side of House
21.50 hours	Common pipistrelle	3 DM	Heard but not seen
21.54 hours	Common pipistrelle	4 DM	Flew from east to west past the south side of House
22.01 hours	Common pipistrelle	5 DM	Heard but not seen, faint
22.03 hours	Common pipistrelle	6 DM	Heard but not seen

Note: Highlighted records indicate emergence or re-entry activity

Appendix IV: Evidence of Bat Roost

Roost location:	**Garage at Rockfield Farm, Undy**	
Survey date(s):	Day survey:	11th December 2018 Diane Morgan, Phoebe Williams (Just Mammals Consultancy LLP)
	Dusk observations:	16th May 2019 Phil Morgan, James Hoskins 29th May 2019 Diane Morgan, Nigel Isaksson (Just Mammals Consultancy LLP)
Description:	A single storey structure, pitched roof, timber framed outbuilding. The south-west end wall is made of stone and set into a bank: this wall contains two arched recesses which are partially blocked off by a piece of corrugated iron leaning across the openings. Side walls and the roof are made of corrugation iron sheeting. The north-east end is open but obstructed by sheets of corrugated tin fallen from the roof. The access opening contains a dense band of nettles. Floor substrate is compacted earth	
Actual and potential bat access points:	Large opening on the north-west side.	
Actual and potential bat roosting sites:	Within the stone arched recesses	
Species and number recorded:	Lesser horseshoe: 1 torpid bat (29th May 2019) in eastern recess of garage.	
Droppings recorded:	None	

Appendix V: Site Photographs 2018

Plate 1: House (south elevation)

Plate 2: Gaps around House roof

Plate 3: House loft looking west

Plate 4: House loft looking east

Plate 5: Barn 1

Plate 6: Interior of Barn 1

Plate 7: East end of Barns 2 and 3

Plate 8: North elevation of Barn 2

Plate 9: Interior of Barn 2

Plate 10: Interior of Barn 3

Plate 11: Barn 4

Plate 12: Interior of Barn 4

Plate 13: East side of Machine Shed (Barn 4 behind)

Plate 14: Dutch Barn

Plate 15: Stables

Plate 16: Hen House

Plate 17: Semi-derelict Garage

Plate 18: South-west end wall of the Garage

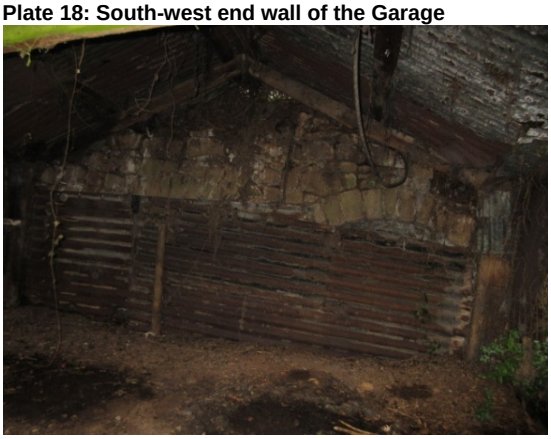


Plate 19: Arched recesses in south-west wall of Garage

Photographs 2019

Plate 20: South elevation of House

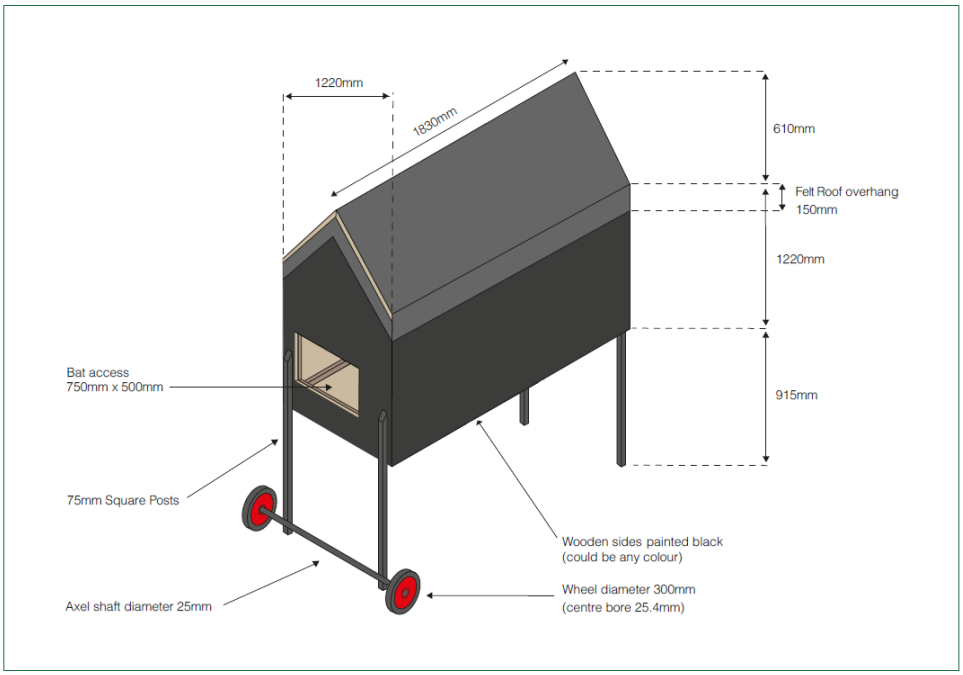
Plate 21: Lesser horseshoe bat in left (east) arched recess of Garage

Appendix VI: Bat Mitigation Features

Figure 3: Cathedine night roost design (© Vincent Wildlife Trust)

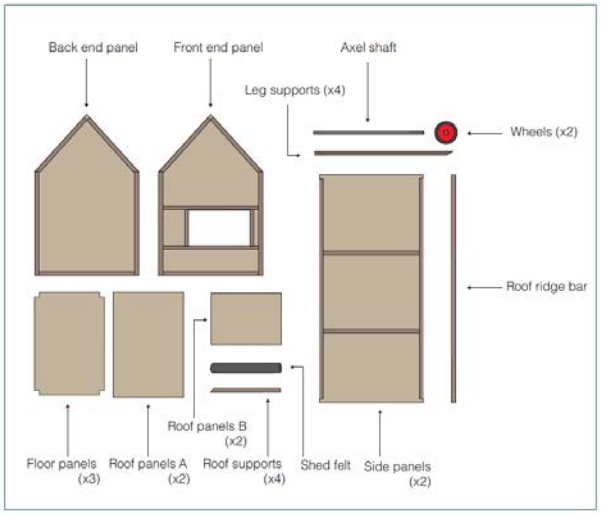
Cathedine Night Roost Design

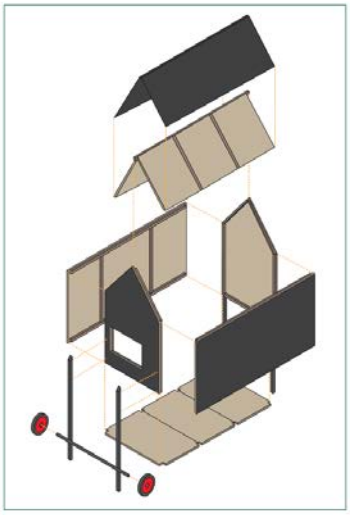
The Vincent Wildlife Trust



Cathedine Night Roost Design

The Vincent Wildlife Trust





Appendix VII: Ecology of British Bats

There are at least 18 species of bats breeding in Britain. Most of them are regarded as threatened due to a variety of factors including habitat loss, intolerance and disturbance/damage or loss of roosts. Of these species a number regularly use buildings at certain times of year in order to find safe secure roost sites. Often several different species can use a building over the course of the year, and not all species are present at the same time, making assessment of their presence complex.

Bats are highly mobile flying mammals, which in Britain, feed entirely on insects. They have evolved over seventy million years and have developed sophisticated mechanisms to allow them to effectively 'see' in the dark by using sound waves. This system is called echo-location which enables them to track and hunt down small moving insects whilst in flight, rather like radar does in a modern military fighter aircraft. It is possible to record this sound, and because each species of bat echo-locates in a different way, determine what the species is without actually handling the animal which made the call.

In winter, when their prey is scarce, British bats hibernate or enter torpor, in cool parts of caves, buildings (cavity walls), and tree cavities. They may wake occasionally and will feed if evening temperatures are greater than 7°C, when flying insects can be active. Generally however, activity during cold winters is very limited and bats only become fully active in spring, with late March and early April being a critical time for animals desperately trying to save energy whilst gaining weight. Disturbance during these months can therefore be more devastating to bats than at other times of year.

By late spring female bats will gather together in maternity roosts in order to give birth and rear their single baby in June. Such maternity roosts are often near to important foraging areas in order to save energy as flight requires vast energy resources. Flight routes to and from such roosts can therefore also be important and some bats are extremely light averse preferring dark locations without street or security lamps which can force them to take complex routes to reach foraging areas. Such lighting can also badly degrade foraging areas where they occur close to buildings and hedgerows and tree lines can be particularly important areas for bat foraging to take place particularly when close to the roost building.

Whilst females form maternity colonies, usually in warmer roofs or trees, male bats tend to seek out cooler sites which may not be so close to the foraging areas. Males are often solitary and do not exhibit the social behaviour that marks out females during the birthing period. Non-breeding females will also roost in this way, when they have no need to spend energy on raising a single baby.

Several British bat species are known to rely heavily on buildings to roost. Of these species, the most likely are the soprano pipistrelle bat and the common pipistrelle. Other bat species regularly found in buildings are the brown long-eared bat; Natterer's bat; Brandt's bats and whiskered bat. Pipistrelle species and the small myotid or mouse-eared species (Brandt's, whiskered etc) often favour locations at the ridge or around the exterior shell of the structure. Brown long-eared and Natterer's tend to prefer living within the roof area of a building – large lofts being popular.

Other species that are known to use the internal areas of built structures such as barns include the two horseshoe species, the greater horseshoe bat (*Rhinolophus ferrumequinum*), and lesser horseshoe bat, as well as Western barbastelle bat (*Barbastella barbastellus*).

Appendix VIII: Relevant Legislation

All species of bat in Britain, and their places of rest are protected under the provisions of the Wildlife and Countryside Act 1981 (WCA), Section 9(1), 9(4)(a) and 9(4)(b) as amended by Schedule 12 of the Countryside and Rights of Way Act 2000. Further protection is afforded by the Conservation of Habitats and Species Regulations 2017. In relation to structures used by bats for shelter or protection (i.e. roosts), this legislation makes it an offence to either intentionally or recklessly damage, destroy or obstruct access to any site used by bats, whether bats are present at the time or not, or to intentionally or recklessly disturb bats within a roost.

Infringements under this legislation include building demolition, removal of hollow trees, blocking, filling or installing grills over old mines or tunnels, building alteration or maintenance work, re-pointing of stone walls, getting rid of unwanted bat colonies, re-roofing, remedial timber treatment, re-wiring or plumbing in roofs, treatment of wasps, bees or cluster flies (Mitchell-Jones, 1992; Childs, 2001). Greater horseshoe bat, lesser horseshoe bat, Bechstein's bat, greater mouse eared bat and barbastelle are included in Annex II of the Conservation of Habitats and Species Regulations 2017 and hence require special protection.

Maximum penalties for committing offences relating to bats or their roosts can amount to imprisonment for a term not exceeding six months or to fines of up to Level 5 on the standard scale under the Criminal Justice Act 1982/1991 (i.e. £5000 in April 2001) per roost or bat disturbed or killed, or to both. Bodies corporate and their directors/secretaries are liable for offences under the 2017 Regulations and the WCA. Additionally, where such an offence results in the offender benefitting in a monetary form from the illegal action, confiscation or civil recovery of the proceeds can occur under the Proceeds of Crime Act 2002.

It is sensible to assess as soon as possible if bats are present at potential sites for development – preferable before the land is acquired. In some cases, the period required for adequate survey work may span more than one calendar year. If a development, including demolition or change of use, is likely to impact on bats and their roosts then a licence will usually be required. Adequate survey results are a necessary input to any licence application. If bats are not found until late in the development stage this may result in delays while a licence is sought and even in offences being committed.

The law with respect to dwellings and other structures is applied equally. Where disturbance is deemed likely to have a significant effect on bats to survive, breed and rear their young or will affect the local distribution and abundance of the species, a European Protected Species licence issued by Natural Resources Wales. A licence application must demonstrate that the development will not be detrimental to the maintenance and conservation status of the species concerned.

This explanation must be regarded only as a guide to the law. For further details, reference must be made to the Wildlife and Countryside Act 1981 (as amended), the Conservation of Habitats and Species Regulations 2017, and the Countryside and Rights of Way Act 2000.

Appendix IX: European Protected Species Licences

Under the Conservation of Habitats and Species Regulations 2017 a licence can only be issued if Natural Resources Wales are satisfied that:

- there are imperative reasons of overriding public interest including those of a social or economic nature;
- there is no satisfactory alternative, and;
- the action authorised will not be detrimental to the maintenance of the population of the species at a favourable conservation status in their natural range.

Natural Resources Wales will require a copy of the full planning consent, as well as an explanation of why there is a need to carry out the proposed work and what alternative solutions have been considered (e.g. other sites) and why they have been discounted. The alternative of retaining the roost within the development must be considered. The last point will depend on the possibility of implementing appropriate mitigation and on assurances that it can be and will be carried out and maintained and the results monitored. Natural Resources Wales aim to process applications within 30 working days, but in practice licences often take longer depending on the number of applications being processed at any one time. NRW do not currently make a charge for issuing a licence but this circumstance is likely to change in the future.

We confirm that in preparing this document we have exercised reasonable skill and care, taking into account the project objectives, the agreed scope of the work, prevailing site conditions, the degree of manpower and resources allocated to the project, and in compliance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct.

This document is valid for a period of two years from May 2019.

Just Mammals Consultancy is an ecological consultancy based in Mid-Wales. Specialising in legally protected mammal, reptile and amphibian species, but providing a wide range of ecological services, it provides appropriate expertise on behalf of a range of clients.

Clients include government departments, local and regional authorities, development agencies, commercial and industrial enterprises as well as statutory nature conservation organisations, wildlife trusts and other charitable bodies.

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