PLAS GRONO FARM, ERDDIG

PRELIMINARY BAT ROOST ASSESSMENT, BAT EMERGENCE SURVEY, AND NESTING BIRD SURVEY

DATE	ECOLOGIST	APPROVED	VERSION	COMMENTS
22/10/20	Jane Kingsley	Lucy Boyett	V1	

Report Ref EE.756.JK.20

Contents

Executive Summary

Site	Plas Grono Farm, Erddig. LL13OYR (SJ 31541 48048)
Surveyors	Jane Kingsley, Rhian Hughes & Lucy Boyett
Proposed work	Barn to be converted into living accommodation, including lowering of the first floor and creating a vaulted ceiling.
Building/structures affected	Barn at Plas Grono Farm (excluding adjoining stable)
Type of survey	Preliminary Roost Assessment (PRA) & nesting bird survey (20/8/20), two emergence surveys (20/8/20 & 7/9/20) and static detector (20/08/2020 – 25/08/2020).
Results of survey	• One soprano pipistrelle emerged from the western gable end, during the first emergence survey. • Droppings and feeding remains consistent with brown long-eared bats (BLE), were found, concentrated at the eastern gable end and also on the first floor. • Static detector placed within the building for five nights, recorded brown long-eared (BLE) (with calls around dawn), common pipistrelle, soprano pipistrelle, and *Myotis* sp. and also two calls from lesser horseshoes (LHS). • Swallows, blue tits, and wrens use the building for nesting.
Survey conclusions	• The surrounding habitat is of high suitability for bats and nesting birds. • The building is used by at least one soprano pipistrelle and by an individual or small number of BLE as a day roost. It is also a regular night roost/ feeding perch for BLE, common pipistrelles, soprano pipistrelles, *Myotis* sp and an occasional roost for lesser horseshoes. • Common and soprano pipistrelle were recorded foraging around the hedge lines. Noctules and lesser horseshoes were active in the area.
Mitigation and enhancement	• **As a bat roost has been identified, no works to the building, can be undertaken until a licence has been obtained from NRW** • A replacement roost will be created within the adjoining stable, suitable for the affected species. • Compensation will also be provided for swallows and other nesting birds.

1.0 Introduction

1.1 Enfys Ecology Limited were commissioned by Mr. Paul Gray to undertake a Preliminary Roost Assessment (PRA), nesting bird survey, two bat emergence surveys and a static detector survey at Plas Grono Farm, Erddig. The surveys were undertaken on the barn section of an outbuilding at the farm, which is due to be developed into two storey living accommodation.

1.2 The survey was commissioned to determine whether the proposed works would affect protected species: specifically bats and nesting birds. The survey work to inform this report was carried out on the 20th August 2020 (PRA and first emergence), 7th September 2020 (second emergence) and between 20th August – 25th August 2020 (static detector survey). This report is valid for a period of two years from this date (September 2020), in accordance with best practice.

1.3 All British bats (and roost sites) are protected under the Wildlife and Countryside Act (WCA) 1981 (as amended). In addition, all bats are classified as European Protected species by The Conservation of Habitats and Species Regulations 2010 (as amended). Under this legislation, it is an offence to kill, injure or disturb a bat, or to destroy any place used as a shelter by bats.

1.4 As evidence of bats has been recorded within the outbuilding and it is deemed likely that they will be disturbed by the proposed works; a licence from Natural Resources Wales (NRW) must be obtained prior to the start of works.

2.0 Site Description

2.1 The surveyed building, was a barn located at Plas Grono Farm, Erddig. It sits at the southern edge of the farm, with agricultural land with crops on three sides and the farmhouse approx. 20m to the north. The barn adjoins a single storey building (not surveyed) currently used as stables. To the immediate north is a small area of semi-improved grassland and a pond. The approximate grid reference of the site is SJ 31541 48048 (Figures 2.1 and 2.2).

2.2 The wider surroundings are predominantly agricultural pasture with the village of Rhostyllen approx. 0.4km to the north and the town of Wrexham approx. 2km to the north-east. There is a railway line 80m to the north-west, lined with trees and scrub, providing connectivity to the wider area. There are also several blocks of broadleaved woodland nearby, including 160m to the north-west and 200m to the north-east. These woodlands are well connected to a much wider network of woodlands to the east, including Erddig Park.

2.3 There are two statutory designated sites within 1km of the site; Stryt Las a'r Hafod, Site of Special Scientific Interest and Johnstown Newt Sites, Special Area of Conservation, both with almost the same footprint, approx 1km to the south. Neither are designated for bats.

FIGURE 2.1 AERIAL VIEW OF THE SITE AND SURROUNDINGS. THE SURVEYED BUILDING IS SHOWN IN RED. BASE MAP © GOOGLE 2020

FIGURE 2.2 WIDER LANDSCAPE, THE SURVEYED BUILDING IS SHOWN IN RED. BASE MAP © GOOGLE 2020

PHOTOS 2.1 AND 2.2. SURROUNDING HABITAT, WESTERN GABLE AND SOUTHERN SIDE OF THE BARN RESPECTIVELY

3.0 Methodology

3.1 *Preliminary Bat Roost Assessment (PRA)*

3.1.1 The building was assessed for any signs of bats; these include droppings, feeding remains, and other indicative marks, plus features of potential use to bats such as crevices, cracks and other holes, and any potential access points into the building. High-powered torches were used to inspect any identified features, and an endoscope was used to investigate any gaps or crevices, where appropriate. Both the interior and exterior of the building were examined.

3.2 *Survey Details*

3.1.2 The building inspection was carried out on the 20th August 2020 by ecologists Rhian Hughes (licence number S087351/1) Lucy Boyett (accredited agent under licence number S087351/1) and Jane Kingsley. Building and potential roost assessments were carried out following the guidelines set by the Bat Conservation Trust Good Practice Guidelines (Collins, 2016). Photographic evidence was taken where necessary.

3.3 *Dusk Emergence Surveys*

3.3.1 Based on the findings of the internal inspections, two evening emergence surveys were carried out on the barn. The building was monitored by three surveyors positioned to be able to observe all sides, using bat box duet and Anabat Scout detectors. Records were taken of any bats observed emerging and of any other bat activity taking place in the area during the survey. In addition, three Anabat Express frequency division bat detectors were positioned with the surveyors, to record calls from any bats, which may have emerged or were active within the area. The surveys began approximately half an hour before sunset and continued for 90 minutes after sunset. The first emergence survey took place on the 20th

August 2020; carried out by Lucy Boyett, Rhian Hughes and Jane Kingsley; and the second on 7th September; carried out by Rhian Hughes, Jane Kingsley and an assistant.

3.4 *Static Detector Survey*

3.4.1 An anabat express was left over five consecutive nights on the ground floor of the barn, to record any calls within the building from 20th August 2020 to 25th August 2020.

3.5 *Limitations*

3.5.1 An anabat detector was placed within the building for the static detector survey to record bats using the interior of the building. The building, however, had many open doors and windows so it cannot be discounted that bats recorded within the static survey were just passing close to the building as opposed to using the interior of it.

3.5.2 Bats are a difficult group to survey, and as bats are highly mobile animals it is possible that they could move into a building after the survey has occurred. Therefore, it cannot be guaranteed that bats will not move into the building following the survey.

4.0 Building Description

4.1 *External*

4.1.1 The building comprised a two-storey, semi-detached barn, with stone and brick walls and a pitched roof with natural slate (Photos 4.1 & 4.2). The barn was rectangular in footprint, with a large opening on the northern side, along with two further doorways (one obscured by vegetation). There were several windows on the ground floor, along with a boarded door on the southern side. There were also two boarded windows on the 2nd floor, on the northern side.

PHOTOS 4.1 & 4.2. NORTHERN AND SOUTHERN ASPECTS OF THE BARN

4.1.2 The western gable wall comprised un-rendered stonework (Photo 4.3) and the eastern gable wall adjoined a single-storey stable (Photo 4.4).


PHOTO 4.3 & 4.4 WESTERN AND EASTERN GABLE ENDS

4.2 *Internal*

4.2.1 On the ground floor, there was a dividing wall, which created a large main barn section and a smaller room on the western side of the building (Photo 4.5 & 4.6).

4.2.2 There were two floors within both sections of the barn, with one area full height to the roof, within the main barn section. This allowed open access from outside to all areas of the main barn section.

4.2.3 The roof was timber framed and lined with bitumen felt, which was in good condition throughout (Photo 4.7). The first floor was open to the roof with skylights on the southern side.


PHOTO 4.5 & 4.6 MAIN BARN SECTION AND SMALLER ROOM ON THE WESTERN SIDE OF THE BUILDING

PHOTO 4.7. 2ND FLOOR

5.0 Preliminary Roost Assessment: Results

5.1 *Potential Roosting Features*

5.1.1 The open doorways and large opening on the northern side of the barn, provided access into the building. The internal space was open with access to the first floor at the eastern end. With skylights on the first floor, multiple windows, open doors and the large opening on the northern side of the building, the light levels were high throughout and there was moderate airflow.

5.1.2 There were numerous crevices in the stone and brickwork, where mortar was missing, some of which may provide access into the barn. The roof was in need of repair, although the bitumen felt largely intact there were a number of slipped and missing slates and raised ridge tiles. There were some gaps underneath barge boards.

5.1.3 No bats were seen during the PRA, however evidence of bats was present. There were a large number of moth and butterfly wings stuck on the internal eastern gable wall and on a ledge underneath the apex, half way up this same wall. There were also further wings on the first floor. A small number of droppings, consistent with brown long-eared bats, were found scattered on the ground floor, underneath the apex at the eastern end and also on the first floor.

5.1.4 Table 5.1 below, provides examples of potential roosting features present and Table 5.2 shows the evidence of bats and birds found.

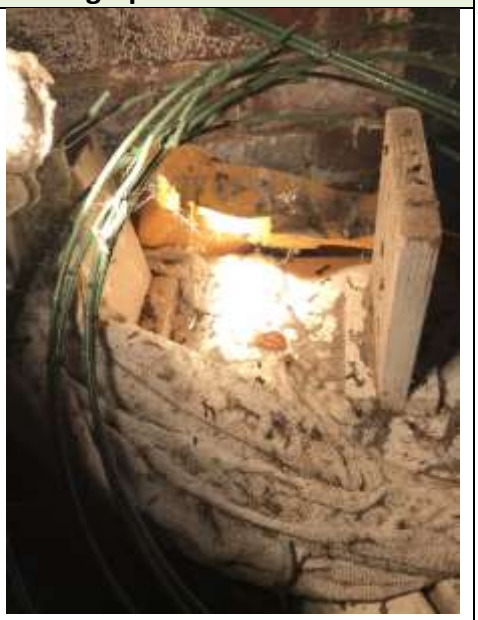
5.1.5 A number swallow nests were seen inside the building, above both the ground floor and first floor beams.

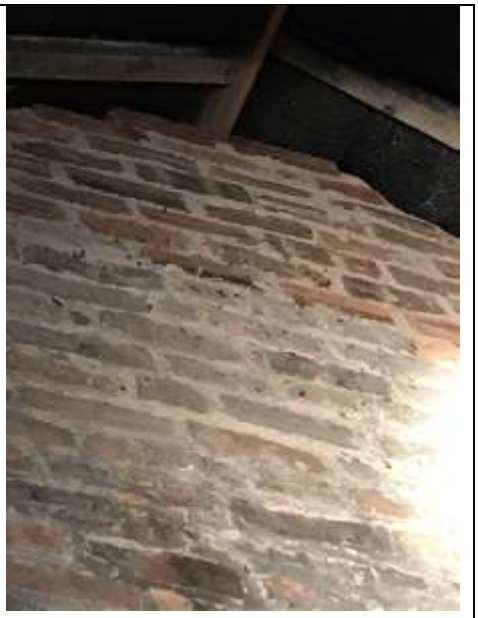
TABLE 5.1 DESCRIPTION AND PHOTOGRAPHS OF POTENTIAL ROOSTING FEATURES

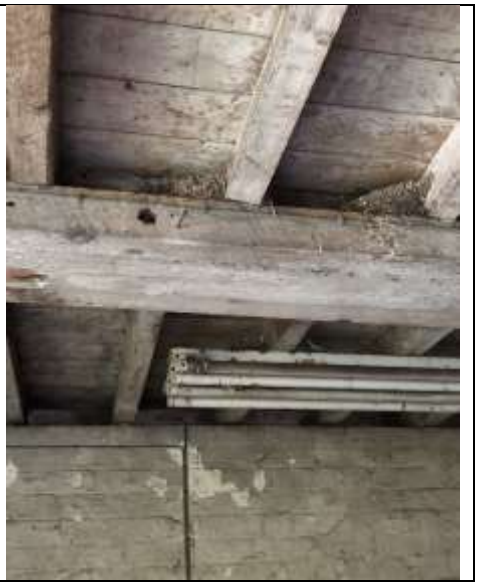
Description of Potential Roosting Features	Photo
Gaps in stonework	
Raised ridge tiles	

Slipped and missing slates	
Open/missing doors	

TABLE 5.2 EVIDENCE OF BATS AND NESTING BIRDS

Evidence	Location	Photograph
Bat droppings, consistent with BLE	• Small number scattered on items on the ground floor. • A collection below the ridge board, at the eastern gable end. • Scattered droppings on first floor, concentrated underneath ridge board.	

Moth and butterfly wings (feeding remains)	• Many wings in cobwebs on eastern gable wall and on ledge underneath ridge board. • Wings on floor, underneath ridge board on first floor.	 

Ground and first floor	Small number of swallow nests	

6.0 Emergence Survey Results

6.1 Following on from the Preliminary Roost Assessment, two emergence surveys were carried out. Table 6.1 summarises the survey details.

TABLE 6.1. SUMMARY OF SURVEY DETAILS

Date	Survey Type	Start Time	Sunset Time	End Time	Temp at Start	Weather
20/08/20	Dusk Emergence	19.57	20:27	21.57	17 °C	Moderate breeze, partly overcast
07/09/20	Dusk Emergence	19.15	19.45	21.15	17°C	Calm, mild, partly overcast

6.2 *Dusk Emergence: 20/08/2020*

6.2.1 Table 6.2, details any emergences and activity during the survey.

TABLE 6.2. SUMMARY OF EMERGENCES AND BAT ACTIVITY DURING THE SURVEY

Species	First/last record (hh:mm)	Notes
Soprano pipistrelle (*Pipistrellus pygmaeus*)	20:41 – 21:36	One bat emerged from western gable at 20:53. Three passes recorded.
Noctule (*Nyctalus noctula*)	20:51 & 21:13	Two passes
Brown long-eared (*Plecotus auritus)*	21:27	One pass, heard but not seen
Common pipistrelle (*Pipistrellus pipistrellus*)	21:27 – 21:57	Three passes

6.2.2 The first bat to be seen was a soprano pipistrelle (*Pipistrellus pygmaeus*), that emerged at 20.53, from the western gable end of the barn. The bat flew around the barn and then left in a northerly direction.

6.2.3 Three brief passes by common pipistrelles, were detected towards the end of the survey, which were heard but not seen.

6.2.4 Two passes by noctules were recorded, one of which passed along the hedge to the south of the site.

6.2.5 At 21:27, brown long-eared was heard but not seen.

6.2.6 A bat was seen to enter the barn through the large entrance on the northern side of the building, however, it did not echolocate. On entering the building at the end of the survey, there was a bat flying inside of the barn, which again was not echolocating but was thought to be a BLE.

6.3 *Dusk Emergence: 07/09/2020*

6.3.1 Table 6.3, details any emergences and activity during the survey.

TABLE 6.3. SUMMARY OF EMERGENCES AND BAT ACTIVITY DURING THE SURVEY

Species	First/last record (hh:mm)	Notes
Myotis sp.	20:05 – 20:20	Four passes heard but not seen, near the northern entrance to the barn.
Soprano pipistrelle	20:14 – 21:26	Regular passes throughout survey
Common pipistrelle	20:13 – 21:14	Regular passes throughout survey
Noctule	20:20 – 21:12	Three brief passes

6.3.1 A bat was seen entering the barn by the large entrance on the northern side. It was not heard by the surveyor but the Anabat placed nearby recorded both a *Myotis.sp* and soprano pipistrelle. Thirty minutes later, another soprano pipistrelle bat was seen to enter the barn.

6.3.2 Common and soprano pipistrelles were observed foraging and commuting along the tree and hedge lines and then later foraging in the adjacent land to the west and south-west.

6.3.3 Three passes by noctules were heard during the survey.

6.2.4 No bats were observed emerging from the building but after the survey a bat was observed flying on the ground floor of the building.

6.2.5 A blue tit and a wren were observed entering and leaving the building above a barge board on the south side of the building.

7.0 Static Detector Results: 20th - 25th August 2020

7.1 The static detector was placed in a central location, on the ground floor of the building, to record any bat activity, within the building, from 20th– 25th August 2020. The weather throughout the static survey period were agreeable with typical bat survey conditions.

7.2 Table 7.1 details the sunrise and sunset times from 20th – 25th August 2020

TABLE 7.1– SUNSET AND SUNRISE TIMES 20TH- 25TH AUGUST 2020

Date	Sunset	Sunrise
20/08/20	20.12	05.55
21/08/20	20.10	05.56
22/08/20	20.08	05.58
23/08/20	20.06	05.59
24/08/20	20.04	06.01

7.3 The static detector recorded high levels of activity including, brown long-eared, common pipistrelle, soprano pipistrelle, and *Myotis sp.* within (or in close vicinity of) the building and also two lesser horseshoe calls. The results from the static detector survey are shown in Table 7.2

7.4 Due to the open nature of the barn on the ground floor, it is possible that some calls recorded could have been picked up by bats outside of the building. However, due to the positioning of the detector and the clarity of the calls, it is thought that most of these will have been from bats from within the building.

TABLE 7.2– RESULTS OF STATIC DETECTOR SURVEY

Date	Time	Species
20/08/20	21:13	Noctule - one call (likely from outside)
	21:36	Soprano pipistrelle - one call
	21:54 - 04:58	Common pipistrelle - sporadic calls
	22:04 & 00:07	*Myotis* sp. - two calls
	00:01 & 04:15	BLE - two calls
21/08/20	22:08 - 04:38 & 05:48 - 06:25	BLE - constant calls
	04:41	*Myotis* sp. - one call
	04:55	Soprano pipistrelle - one call
22/08/20	21:11, 00:20 & 00:32	Noctule - three calls (likely from outside)
	22:31 - 02:58	BLE - fairly constant
	02:23 - 02:25 & 04:31 - 04:32	Common pipistrelle
	02:25 - 02:26	*Myotis* sp. - two calls
	23:46	Lesser horseshoe - one call
23/08/20	23:33 - 03:40 & 04:48 - 05:59	BLE - constant throughout
	04:28	Common pipistrelle - one call
24/08/20	21:09 - 06:02	5 *Myotis* sp. calls
	21:43	Lesser horseshoe - one call
	22:29 - 05:45	BLE - constant throughout

8.0 Discussion and Evaluation

8.1 Under the Good Practice Guidelines (Collins, J.,2016) the immediate area provided highly suitable habitat for commuting and foraging bats with good connectivity to further suitable habitats in the surrounding area.

8.2 There were many large access points into the building, through open doorways, and windows and there was suitable habitat for crevice dwelling bats beneath slipped slates, raised ridge tiles and within gaps in stone and brickwork. The open nature of the building, meant much of the space was light and draughty during the day, making it less suitable for non-crevice dwelling bats such as lesser horseshoe.

8.3 *Day Roost*

8.3.1 During the first emergence survey, a soprano pipistrelle was seen to emerge from the western gable end of the building. The static detector also recorded calls from a number of different species, however, BLE calls were recorded until sunrise on most mornings, which suggests it is likely to also be a day roost for BLE.

8.3.2 The building is therefore used by at least one soprano pipistrelle and by an individual or small number of BLE as a day roost.

8.4 *Night roost/feeding perch*

8.4.1 Droppings from BLE were found, predominately under the ridge board at the eastern gable end and on the first floor. Feeding remains, which are commonly associated with BLE, were seen throughout the building but again were mostly concentrated at the eastern gable end and on the first floor.

8.4.2 The static detector recorded predominantly BLE calls, however there were also sporadic calls from *Myotis* sp*.,* soprano and common pipistrelle over the five nights. There was also one lesser horseshoe call on two of the five nights. Noctule calls were also heard, however, its low frequency call can be detected from further away than other species, it is therefore very likely to have been from outside the building.

8.4.3 The building is therefore a regular night roost/ feeding perch for BLE, common pipistrelles, soprano pipistrelles, *Myotis* sp and an occasional roost for lesser horseshoes.

8.5 *Impact of works*

8.5.1 The proposed works are to convert the barn into auxiliary living accommodation, which will require a full program of renovations, including lowering the first floor and installing a vaulted ceiling.

8.5.2 The bat mitigation guidelines state that the roost status for a small number of common bats (not a maternity site) and feeding perches of common/Annex II species (LHS), is considered to be of low conservation significance (Mitchell-Jones. A.J, 2004). Provision of new roost facilities must be provided where possible. Although these need not be exactly like-for-like, they should be suitable, based on species requirements (Mitchell-Jones. A.J, 2004).

8.5.3 To reduce the scale of impact, mitigation, compensation and enhancement measures will need to be in place, as well as specific working methods. These will be provided in detail within the licence method statement but some measures are included (but not limited to) in Section 9.

8.6 *Birds*

8.6.1 A number of nests, including swallows, were observed on both the ground and first floors, along with old and fresh droppings. During the second emergence survey, blue tits and wrens were seen entering the building under barge boards on the southern side of the building.

8.6.2 All birds (and their nests) are legally protected under the wildlife and countryside act 1981 and it is an offence to intentionally take, damage or destroy the nest of any wild bird while it is in use or being built (as well as kill or injure wild birds of their eggs). Any destructive works to the building will be constrained by the bird nesting season, or require checks by an ecologist immediately prior to works. Compensation for the loss of bird nesting areas will be

in the form a variety of bird boxes, as well as available space for swallows around the site. Full mitigation and compensation will be detailed in Section 9.

8.7 *Other species*

Due to proximity of Stryt Las a'r Hafod SSSI and Johnstown Newt Sites SAC (1km to the south west), designated for great crested newts (GCN), a data search was carried out and the presence of GCN was recorded 148m to the south of the site. If any future work is proposed that will involve groundwork at the site, GCN surveys are likely to be required. For the current proposed works, Reasonable Avoidance Measures detailed in Section 9.8 will be appropriate.

9.0 Mitigation, Compensation and Enhancement

9.1 **As the barn is a known bat roost, no works to the barn must commence until a licence has been obtained from NRW. A licence can only be applied for following the granting of planning permission and the discharge of any ecology related conditions. Once submitted the licence application takes 30 working days to be processed (or more if any there are any queries).**

9.2 Mitigation, compensation and enhancement measures will be included in the licence application and are also included below.

9.3 *Mitigation - Destructive Works*

- Any destructive works such as removal of fascia's/soffits/barge boards, works to the roof or re-pointing of stonework, can take place at any time of the year, however, it is preferable that they are undertaken between mid-September and 30th April, when it is least likely for bats to be present. Within this timeframe, it is preferable for the works to be undertaken mid-September – October so if any bats are found they will not be in hibernation but they will have finished breeding or April, prior to breeding.

- Prior to the start of works, a toolbox talk will be given to everyone involved in the project and a log of this will be kept.

- Any works to the roof including the removal of slates, fascia's and soffits or repointing of the stone or brick walls will be supervised by a suitably qualified ecologist. At this time, a bat box will be available and if a bat is found during works, the box will be erected for the bat to be placed in. If carried out over winter and a hibernating bat is found, work must stop until the bats have dispersed naturally if possible. If this is not possible then the bat must be placed in a box suitable for hibernation erected on the property.

9.4 *Compensation & Enhancement – Roost Replacement*

9.4.1 The bat mitigation guidelines recommend that for roosts of low conservation significance, new roost facilities should be provided where possible. The new roost need not be exactly like-for-like, but should be suitable, based on species' requirements (Mitchell-Jones. A.J, 2004).

9.4.2 In line with Planning Policy Wales, and following the Environment Wales Act (Section 6) and guidance provided in the recent letter by the Chief Planner in Wales, there is a requirement to ensure that a net benefit for biodiversity is provided in all applications for planning in Wales.

9.4.3 To compensate for the loss of the day and night roost and feeding perches, a new bat roost area will be created within the roof space of the adjoining stable (Photos 9.1 & 9.2). The new bat roost must be completed before works can begin to the barn.

PHOTOS 9.1 & 9.2 ADJOINING STABLE FOR NEW ROOST CREATION

9.4.4 The specifications of the new roost within the adjoining stable are detailed below:

- The new roost will comprise a boarded area within the roof space, measuring at least 3m x 3m, with a floor to roof apex height of 2.8m (1.8m minimum, as not a maternity roost).
- The roof will be of appropriate design to provide an as open and unimpeded loft void space as possible, to allow free movement and flight by bats inside the space.
- Only timber treatments listed on Natural England Technical Information Note TIN092 will be used on the timbers.
- The roof within the bat roost will be underlined with F1 bitumasticfelt only (no breathable membrane can be used).

- Two bat access points will be created, at the eaves, provided by 100mm x 20mm slots cut through the eaves boards. Alternative methods of creating these access points at the eaves are shown in Appendix A. Internally, baffles will be created to prevent light and draughts into the main roosting area.

- Further access points will be provided by two bat vent/access slates.

- The roost will include two Kent style wooden bat ladders, to be situated on the ridge beam/purlins/rafters.

- A double ridge board will be created, both consisting of rough-sawn and untreated timber, set 20mm, which will offer bats enhanced roosting opportunities.

- Two panel boxes will be created and mounted on two sides of the roost, providing additional roosting space. These will comprise a piece of plywood board fitted to 1 inch x 1 inch timbers with a gap on the underside only so bats can access the space from underneath.

- Sound insulation will be installed, if the roost is to adjoin the new ancillary accommodation, to prevent disturbance.

- There will be a small loft access hatch installed in the floor of the bat loft approximately 0.45m x 0.45m, allowing access for the bat ecologist to inspect if required, but preventing access to store items. The loft hatch will be closed and locked with a combination padlock to prevent unauthorised access. This will be offset slightly so it isn't directly under the roof apex.

- Scrub planting should take place around the entrance to the bat loft space to provide connectivity and foraging habitat for the bats.

9.5 *Lighting*

9.5.1 The habitats surrounding the building, are highly suitable for bats and the emergence survey recorded bats using these areas to commute and forage. Therefore, any new lighting has the potential to impact bats and nocturnal birds.

9.5.2 To reduce the potential impact of additional lighting, which may be installed, the following measures will be incorporated into the lighting design.

- There must be no lights focused on the entrances to the new roost and should also avoid trees and linear features such as hedgerows.

- Any external or security lighting should be limited to provide some dark periods during the night. Ideally the lighting should be motion activated, and not stay on longer than

one minute, in order to provide maximum darkness when not needed as well as providing safe lighting conditions for residents when required.

The following luminaire specifications are provided by Bat Conservation Trust and Institute of Lighting Professionals (2018) and must be considered if new lighting is to be installed.

- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component.
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill.
- Only luminaires with an upward light ratio of 0% and with good optical control should be used.
- Luminaires should always be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting should be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

9.6 *Monitoring*

9.6.1 Monitoring should take place in the summer of year one following completion of works (so works have been complete for a year prior to monitoring) after the works have been completed and again in year three. This will initially be through an internal inspection and leaving static detectors on site, however, emergence surveys may be required if no evidence of bats is found.

9.7 *Birds*

9.7.1 Evidence was found that birds nest within the building, specifically swallows. Where possible, work to these areas within the building should be avoided during the bird nesting season (April to September inclusive). If this is not possible, a bird nest check needs to be carried out by a qualified ecologist no less than 48 hours before works commence. If birds

are found nesting in the buildings during any point in the works, all works to that area must **stop** and only continue once the chicks have fledged.

9.7.2 In order to provide compensatory nesting areas for swallows, a purpose made covered nest box structure (Figure 9.1) should be erected in an appropriate place within the site or at least four nesting cups should be fitted within the adjoining stable or storage area.

9.7.3 Examples of swallow nesting cups can be found online from several suppliers including NHBS website (www.nhbs.com), the RSPB, and others. The following is one example of a nest cup suitable for the mitigation work: https://www.nhbs.com/browse/search?q=swallow+nest&qtview=194571

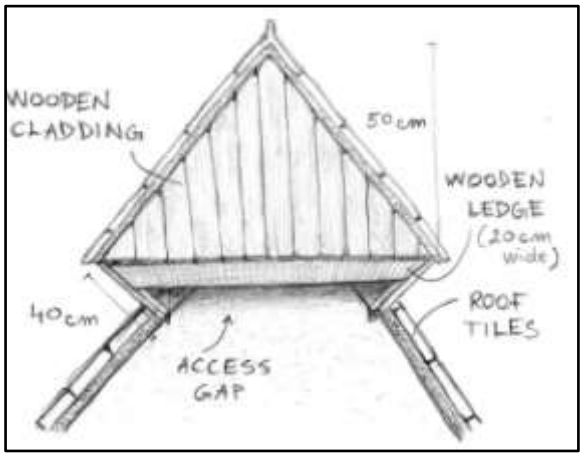


Figure 9.1 Example of a purpose made covered nest box for swallows.

9.7.3 To compensate for the loss of bird nesting habitat and enhance the site for birds; bird nesting opportunities will be provided by including bird boxes on trees or on the building. A minimum of four boxes suitable for small birds need to be erected on site, two suitable for house sparrows with a 32mm entrance, and two for smaller birds (28mm). Examples of suitable bird boxes can be found at the following links: https://www.nhbs.com/vivara-pro-seville-32mm-woodstone-nest-box; https://www.nhbs.com/vivara-pro-seville-28mm-woodstone-nest-box. Woodstone boxes are more durable and require less maintenance than wooden boxes.

9.8 *Other species*

9.8.1 *Reasonable Avoidance Measures*

To reduce the potential to impact to other species such as amphibians (including GCN), if any materials brought to the site are to be stored externally, they must be either stored on hardstanding or if this is not possible, they are elevated off the ground, for example, on pallets to avoid creating refugia habitat.

10.0 Legislation

10.1 *Bats*

The Wildlife and Countryside Act (WCA) 1981 (as amended) forms the key legislation protecting habitats and species in the UK. All UK bat species are fully protected under the 1981 Act through inclusion on schedule 5. All bats are also listed under Schedule 2 of the Conservation of Habitats and Species Regulations 2017 which transcribes the EC Habitats Directive into UK law. In combination, this legislation makes it an offence to:

- Deliberately or recklessly take, injure or kill a bat;
- Deliberately or recklessly damage or destroy a place or structure used by bats for shelter or protection;
- Deliberately or recklessly obstruct access to a bat roost; or
- Deliberately or recklessly disturb bats while occupying a roost.

Bat roosts are protected under these laws whether the animals are present at the time of survey or not. Under both laws the Welsh Government and D.E.F.R.A. are empowered to issue licences to carry out work to bat roosts for reasons of overriding public interest. It is not illegal to tend to a disabled bat pending recovery.

In addition, under the Wildlife and Countryside Act all birds, their nests and eggs are protected during the breeding season (typically March to August inclusive) from killing/destruction, damage and disturbance.

10.2 *Birds*

In addition, under the Wildlife and Countryside Act, 1981 (as amended) and the Countryside and Rights of Way, 2000, all wild birds, their nests and eggs are protected during the breeding season (typically March to August inclusive). This makes it an offence to:

- Intentionally kill, injury or take any wild bird.
- Take, damage or destroy the nest of a wild bird included in Schedule ZA1.
- Take, damage or destroy the nest of any wild bird while that nest is in use or being built.
- Take or destroy an egg of any wild bird.

10.3 *Biodiversity Net Gain – Relevant sections of legislation*

- Section 6 of the Environment (Wales) Act 2016:

Biodiversity and resilience of ecosystems duty

(1)A public authority must seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions.

(2)In complying with subsection (1), a public authority must take account of the resilience of ecosystems, in particular the following aspects—

(a)diversity between and within ecosystems;

(b)the connections between and within ecosystems;

(c)the scale of ecosystems;

(d)the condition of ecosystems (including their structure and functioning);

(e)the adaptability of ecosystems.

…. (5) In complying with subsection (1), a public authority other than a Minister of the Crown or government department must have regard to—

(a)the list published under section 7;

- Section 7 of the Environment (Wales) Act 2016:

Biodiversity lists and duty to take steps to maintain and enhance biodiversity

(1)The Welsh Ministers must prepare and publish a list of the living organisms and types of habitat which in their opinion are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales.

(2)Before publishing a list under this section the Welsh Ministers must consult the Natural Resources Body for Wales ("NRW") as to the living organisms or types of habitat to be included in the list.

(3)Without prejudice to section 6, the Welsh Ministers must—

(a)take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section, and

(b)encourage others to take such steps.

11.0 References and Useful Information Sources

Bat Conservation Trust (2018) *Bats and artificial lighting in the UK- bats and the built environment series* www.bats.org.uk

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

Mitchell-Jones (2004) *Bat Mitigation Guidelines.*

Stone, E.L. (2013) *Bats and lighting: Overview of current evidence and mitigation guidance.*

Appendix A

Figure 1 – Bat access at the eaves using a 'Bat Brick'

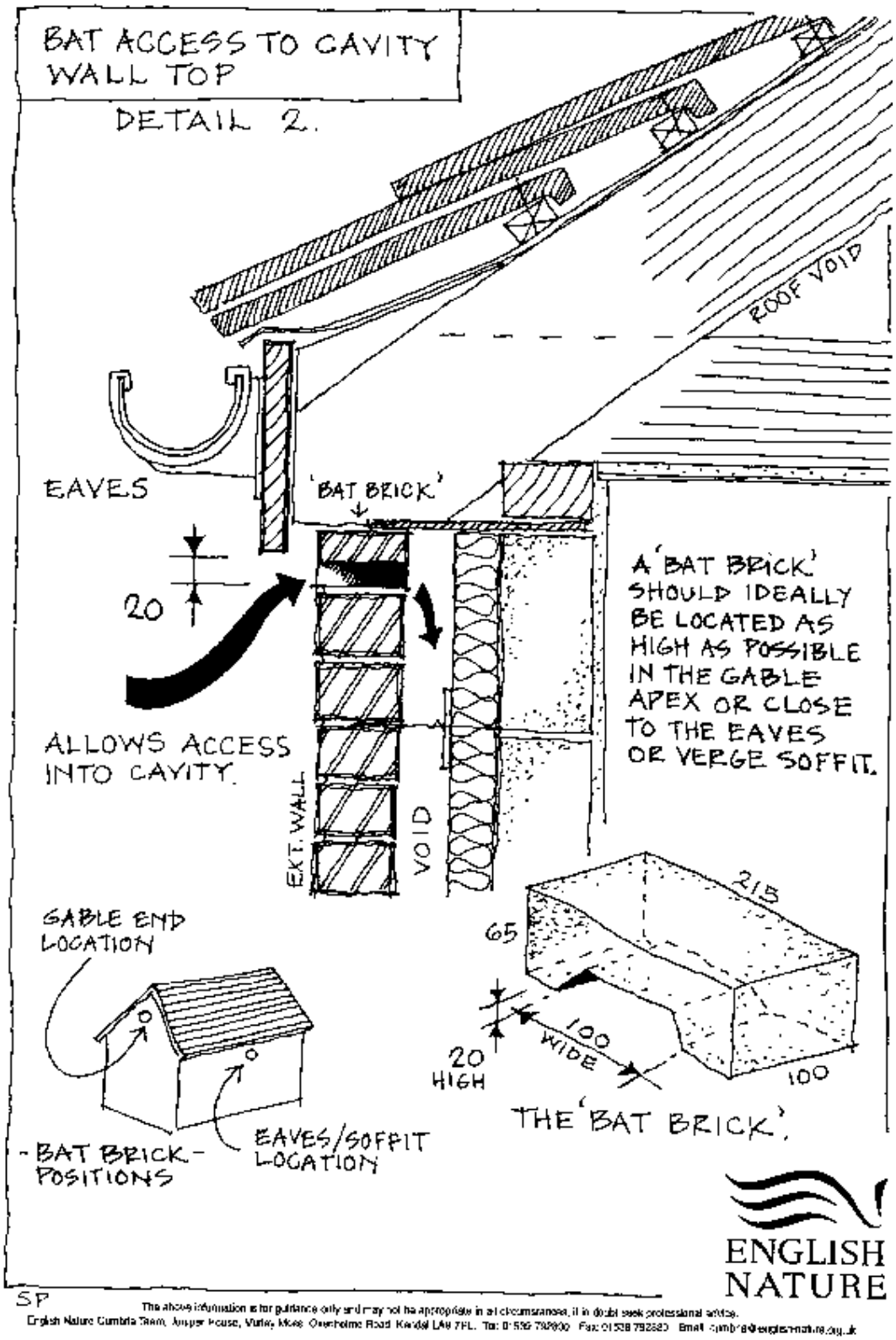


Figure 2 – Bat access at the eaves through fascia board