



Report Type: Mitigation Strategy

Client Name: Jones

Site Address: Brunett Barns
Lower Wych Lane
Ty Broughton
Whitchurch
SY13 3BA

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Date of Issue: 6th April 2023

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Questions arising from the survey report should be directed to the author of the report who will be pleased to clarify any technical issues raised.

Whilst the surveyors make every reasonable effort, Greenscape Environmental Ltd cannot guarantee that all protected species have been identified and survey results are definitive. Many species are cryptic and transitional in habit.

The use of this report or survey data for any form of formal submission to an NGO or other authority implicitly implies acceptance of the terms and conditions.



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1 Executive Summary

1.1 Background information

Greenscape Environmental Ltd was commissioned by Mr C Jones to undertake an update of the ecological appraisal of barns at The Brunette, Ty Broughton to provide supporting information for a new planning application for barn conversion to residential accommodation. An updated report was provided in March 2022 following survey work in August 2021. Advice was given at this time that a licence from NRW would be required. The building work was commenced prior to planning approval. Subsequently, in 2023, the Council and Natural Resources Wales (NRW) requested further information with respect to the mitigation strategy to ensure a mitigation licence could be obtained from NRW and the existing bat populations on site would be maintained at favourable conservation status. The clients have self-certified that all the method statements have not been followed.

Prior to 2021, the site had been surveyed for bats in 2018 and 2013.

A site visit was conducted on 17th February 2023. Evidence of recent (likely last summer) bat activity was recorded in the loft of Barn 2 in the form of one bat dropping on material from alterations to roof. No other evidence of bats was recorded in any of the other buildings.

This report has the principal aim:

- To identify measures to reduce and manage negative impacts on bats of this development, and to provide a situation where favourable conservation status of the bats in the barn conversions will be maintained.

1.2 History of roosts and Key Impacts

Low numbers of 4 common bat species were identified in activity surveys conducted in 2018. It was deemed necessary for the work to be conducted under Mitigation licence from Natural Resources Wales (NRW). An update of the survey was conducted on 2nd and 16th Aug 2021. Bat species recorded included day roosts of brown long eared bat, common and soprano pipistrelle bat. A Natterers bat was also recorded. These results are similar to 2018 observations, but roost positions had altered.

One bat dropping was recorded in barn 2 in February 2023, and no hibernating bats were observed.

A total of 5 bat roosts of 4 species will be impacted taking both years surveys into consideration.

Likely greatest impacts will be:

Species and status	Greatest Impact without consideration
Brown Long eared bat day roost	Bat roost will be lost in Barn 1.2. Risk to individual bats. Disturbance
Common pipistrelle bat day roost	Bat roost will be damaged in Barn 2. Risk to individual bat. Disturbance
Soprano bat day roost	Bat roost will be lost in Barn 1.2. Bat roost will be damaged in Barn 2. Risk to individual bat. Disturbance
Natterers Bat	Bat roost in Barn 1.1 will be lost. Possible risk to individual bat. Disturbance



Loss or damage of the roosts and possible harm to bats would constitute an offence under the regulations. In order to continue the work, a licence from Natural Resources Wales is required.

1.3 Mitigation Strategy- Summary

An update of the bat activity surveys will be required between May- Aug 2023. Even if no bats are identified using the buildings, given the history of the site, the licence will be required.

Building identification	Roost	Recommendation
Barn 1.1	Was a metal roof in 2018. This was removed by 2021 and replaced with breathable membrane and then slated by Feb 2023 visit	Bat activity survey May 2023. Licence before remedial work and bat exclusion. Re-roof with bitumen hessian lining so bats cannot come into contact with breathable membrane.
Barn 1.2	Was unlined slate in 2021. Now re-roofed with NBBRM with 1m strip of Bitumen hessian along ridge and bat access to ridge. Bat roost in this location	Bat activity survey May 2023. Licence before remedial work. Re-roof with bitumen hessian lining so bats cannot come into contact with breathable membrane.
Barn 1.3	This building had no roof in 2017-8 or 2021. It is now watertight and re-roofed in a similar manner to above barns. Negligible roost potential in 2021	No constraints
Barn 1.4	Round roofed barn with corrugated metal roof of negligible value to bats has not been altered. No roost identified, negligible roost opportunities	No constraints
Barn 2	Re-roofed with like for like metal. A bat loft has been provided with a section being lined with bitumen hessian lining so bats cannot come into contact with non-bitumen coated roofing membrane (NBRM). One bat dropping from summer 2022 observed (assumption)	Activity survey May 2023. Reroof with slate lined with bitumen hessian lining throughout once licence is in place. No timing constraints.

1.4 Conclusion

Ongoing conversion work of the buildings and roof works must be conducted under a Mitigation Licence from Natural Resources Wales.



Compensation for the loss of the bat roosts will consist of bat access along the ridge of the buildings. The buildings Barn 1.1 and Barn 1.2 will need to be altered so bats cannot come into contact with non-bitumen roofing material (NBRM).

Barn 2 will be re-roofed with a slate roof lined with bitumen hessian lining material, and have provision of a bat loft.

It will be ensured that a separate bat box is erected for each bat species around site.

The constraint plan provided in section 4 of this report will be followed, and work will be conducted at a suitable time of year to minimise potential impacts.

There are no other ecological constraints to the development as currently proposed.

Table 1.1. Timing of Works

Action	Timing	Justification
Update emergence/re-entry survey	May-end Aug 2023 to update observations on barn 1	To ensure site conditions have not significantly altered prior to re-commencement To assist with licence application as data is no longer considered sufficient.



2 Introduction

This report has been compiled by Peta Marshall BSc (hons) MA who has over 15 years' experience conducting ecological appraisals. It has been reviewed in line with Greenscape's Quality Management System.

For full details of surveyors and licences please see Appendix A.

2.1 Project Background

Greenscape Environmental Ltd was commissioned by Colin Jones to conduct a survey to determine the presence of protected species and potential for the damage or destruction of habitats of value. This forms part of the planning application for a barn conversions at The Brunett.

The site was previously surveyed in 2018 and 2021 by Greenscape Environmental and in 2013 by J W Ecological Ltd.

Year	Species	Peak Count
2013	Common pipistrelle	2
2018	Common pipistrelle	1
	Soprano pipistrelle	2
	Brown long eared bat	1
	Natterer's bat	1
2021	Common Pipistrelle	1
	Soprano pipistrelle (Barn 2)	1
	Brown long eared bat	1
	Natterers bat	1

Mr Jones and family purchased the barns in February 2021 and have commenced work on the buildings in order to conserve the grade II listed building. Work had been halted due to the lack of EPS licence, and a report was produced in order to support the licence application and the alteration in plans. Since 2021 further work to stabilise the buildings has been conducted. This includes re-roofing and internal alterations.



2.2 Field Survey

2.2.1 Date and Survey Conditions

Table 2.1. Survey conditions

Date	Time Start – End (Sunset Time)	Structure	Equipment Used	Weather
02/08/2021	20:53-22:27 (21:03)	Barn	Camera, Anabat Walkabout, Anabat SD2 and LED Torches	13°C light breeze, 50% overcast high cloud
Comments	Two surveyors used: Peta Marshall, Brian Marshall			
16/08/2021	20:00-22:00 (21:35)	Barn	Anabat Walkabout x3, Anabat SD2 and LED Torches	15°C light breeze overcast, no rain
Comments	Three surveyors used: Peta Marshall, Brian Marshall, Chloe Sheil			
17/02/2023	Day	Barns	Camera, strong torch	5°C Clear, light breeze
Comments	One surveyor used: Peta Marshall			



3 Building Identification

3.1 Buildings

The same notation for the barns has been used as in the Greenscape report from 2018.



Figure 3.1. Buildings on site 2018

An update site survey was conducted on 17th February 2023. The following alterations have been made, with an additional comment on whether fit for purpose for bats.



3.2 Status of buildings and bat provision- 2023

Building	Ongoing works	Observations
Barn 1.1	Original metal sheet roof replaced with slates, with the addition of 1m strip of bitumen hessian lining along ridge.	Bats can still come into contact with non-bitumen coated roofing membrane (NBRM)
Barn 1.2	Unlined slates removed and building re-roofed with non-bitumen coated roofing membrane (NBRM) and again, a strip of bitumen hessian lining under the ridge on one face only. Gaps provided under a selection of ridge tiles.	Bats can still come into contact with non-bitumen coated roofing membrane (NBRM). Gaps under ridge tiles considered to be too large for crevice dwelling bats.
Barn 1.3	This building had no roof in 2017-2018. It is now watertight and re-roofed in a similar manner to above barns.	No suitable access or materials for bats to roost safely. Never known to be a bat roost
Barn 1.4	Round roofed barn with corrugated metal roof of negligible value to bats has not been altered.	
Barn 2	A bat loft has been provided with a section being lined with bitumen hessian lining so bats cannot come into contact with non-bitumen coated roofing membrane (NBRM)	A bat dropping was observed in the bat loft section, but it is still not considered fit for purpose by NRW representative.



3.2.1 Barn 1.1



Figure 3.2. Building 1.1 (Aug 2021)

In 2018 Barn 1.1 had a metal roof.

2021- Since the survey in 2018, the roof of building 1 had been stripped and the metal roof replaced with modern breathable membrane. There were significant gaps along the eastern elevation of the building where, for structural reasons, the building has had to be strapped and secured.



Figure 3.3. View from interior through eastern elevation (Aug 2021)

Scattered bat droppings were seen on the mezzanine floor to the north of the building. These seemed to be associated with areas where there remains open mortice joints in the timbers.

Work had been stopped on this building by the council. The southern gable end was seen to be in as poor condition as in 2018.



Figure 3.4. Southern gable end (Aug 2021)

2023 - The missing brickwork has been replaced and internal stud work erected. This makes the building on the first floor darker and potentially of more interest to bats for roosting. A bat box has been erected on the northern elevation of the building.



Figure 3.5. Barn 1.1 in February 2023

No bat droppings were observed. The constraint for this observation was that the survey was conducted in February when bats are not active. No indication of how much clearing had been made during the ongoing work on site.



Figure 3.6. Open mortice joint in roof timbers (Feb 2023)

Open mortice joints were still apparent in February 2023 and this is where a bat roost was identified in 2021



Figure 3.7. View of bitumen hessian along ridge placed above the breathable membrane.

A length of bitumen hessian lining material had been added to the ridge to allow bat access from slightly raised ridge tiles to this area.



3.2.2 Barn 1.2



Figure 3.8. Barn 1.2 (Aug 2021)

2021- Barn 1.2 had not been worked on by the current client. The slate roof was seen to have no lining material. A bat detector was left in this area and bat activity monitored during the bat surveys.

The eastern end of this building opens into barn 1.1.

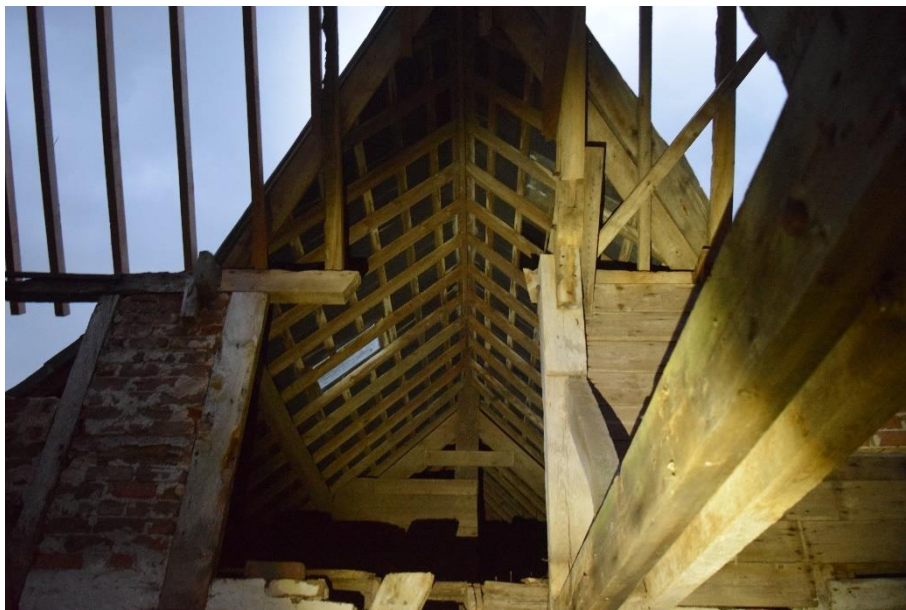


Figure 3.9. Opening into barn 1.1 (Aug 2021)



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This section of the building remained dark, but the slate roof was not lined and clear gaps can be seen between the roof and the western gable end. The building offered low opportunity for bats.



Figure 3.10. Showing gap along western elevation

Scattered bat droppings were observed within the building on stored items, but there was not enough accumulation of droppings to suggest the presence of a maternity roost.

Feeding remains of yellow underwing moth were observed suggesting presence of a brown long eared bat.

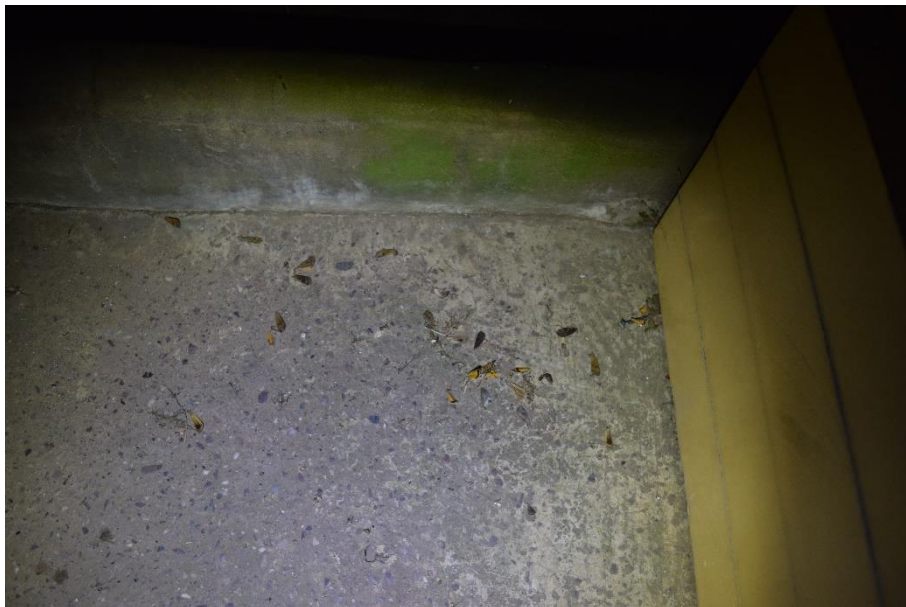


Figure 3.11. Feeding remains



2023- Update for Barn 1.2

Significant work had been undertaken with the roof stripped and replaced with modern breathable membrane and a strip of traditional bitumen hessian lining at the ridge. The buildings had been separated with internal wall.



Figure 3.12. Alterations to Barn 1.2 (Feb 2023)

No bat droppings were observed on the floor in this area, however the concrete floor that had been present in 2021 had been removed with hardcore floor currently in place.

The bat access tiled are considered to be slightly too large for crevice dwelling bats.



Figure 3.13. View of ridge tiles with vents (Feb 2023)



3.2.3 Barn 1.3



Figure 3.14. Barn 1.3 (Aug 2021)

2021- Barn 1.3 had no roof. The building was examined internally and no evidence of bat activity was noted. The building was considered to have negligible potential for bat roosts.

2023- The building had been re-roofed with NBRM but no other alterations conducted.

3.2.4 Barn 1.4

2021 - There have been no alterations to building 1.4 since 2018. This is still a metal roofed structure with block and timber on the southern elevation.



Figure 3.15. Building 1.4 (Aug 2021)



Figure 3.16. Interior of barn 1.4 (Aug 2021)

No bat droppings were seen within this building and with gaps along the wall plates is considered to have low potential for bat roosts.

2023- no alterations had been made to this building.



Figure 3.17. Barn 1.4 Feb 2023



3.2.5 Barn 2

2021- Barn 2 has been re-roofed with a replacement metal roof and breathable membrane. The building had a metal roof in 2018 so this was essentially a like for like replacement.



Figure 3.18. Building 2 (Aug 2021)

Large spaces are visible into the roof void of the building which allows continued access for bats.



Figure 3.19. Showing potential bat access areas. (Aug 2021)

The building is being used for storage and no further construction work is anticipated now the building has been stabilised.



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As no further alterations are anticipated, no further surveys were considered necessary, but as surveyors were situated close to the western aspect of the building, some was possible.

2023- The central roof void had been modified to create a bat loft as was in the conservation plan in 2021.

The void is over 2.5m high to the apex, 4x5m approximately in size. The bat access was left at the eaves of the building, and the void had been lined with bitumen hessian lining material and OSB board.



Figure 3.20. Void left for bats in Barn 2.

One bat dropping was observed on a strip of left over felt, indicating the possible use of the void from last summer.



Figure 3.21. Bat dropping seen on new material in new loft area Feb 2023



3.2.6 Phase 2 Bat Activity Survey 2021

Building 1 was examined internally and externally prior to each evening bat activity survey. No bats were observed in any crevices.

Date	Time Start – End	Species and Numbers	Roost Type	Structure	Roost Location	Access Points
02/08/2021	20:30-22:45	Soprano pipistrelle x1	Day	Barn 1.2	Western section	Southern gable of barn 1.1
		Brown long-eared bat x1	Day	Barn 1.2	Western section	Southern gable of barn 1.1
		Natterer’s bat x1	Day	Barn 1.1	Eastern side	Mortice joint
Notes:	A soprano pipistrelle was seen to emerge from the southern gable end of barn 1.1 at 21:25. This was recorded foraging around the building until the end of the survey.					
	A brown long eared bat emerged from barn 1.2 at 21:43, and was seen to fly south out of 1.1.					
	At 21:59 a Natterer’s bat was recorded from the ridge of the barn 1.1.					
	A common pipistrelle emerged from a roost in barn 2, entered barn 1.2 to forage and emerged again through an opening on the wall of the barn.					
	Constant foraging around the buildings was noted.					
16/08/2021	20:00-22:00	Soprano pipistrelle x1	Day	Barn 1.2	Western section	Seen to come from inside dark area
		Soprano pipistrelle x1	Day	Barn 2	Western gable end	Under eaves
		Brown long eared bat x1	Day	Barn 1.2	Western section	Seen to come from inside dark area
		Natterer’s bat x1	Day	Barn 1.1	Eastern side	Mortice joint
Notes:	P Marshall stood within the building to more closely observe the activity and monitor where the roosts were.					
	20:50, a soprano pipistrelle emerged from the western section of barn 1.2 and left via southern gable.					
	20:59 a brown long eared bat was observed from the western section of barn 1.2.					
	21:05 a soprano pipistrelle was observed emerging from the re-roofed barn to the east of the site.					
	21:12 a Natterer’s bat was observed from the northern end of barn 1.1.					
	No emergences were recorded by the surveyors to the north or south of the building, but regular passes by soprano and common pipistrelle were noted.					

From the position of the droppings, the roost positions in barn 1.2 is under the central ridge.

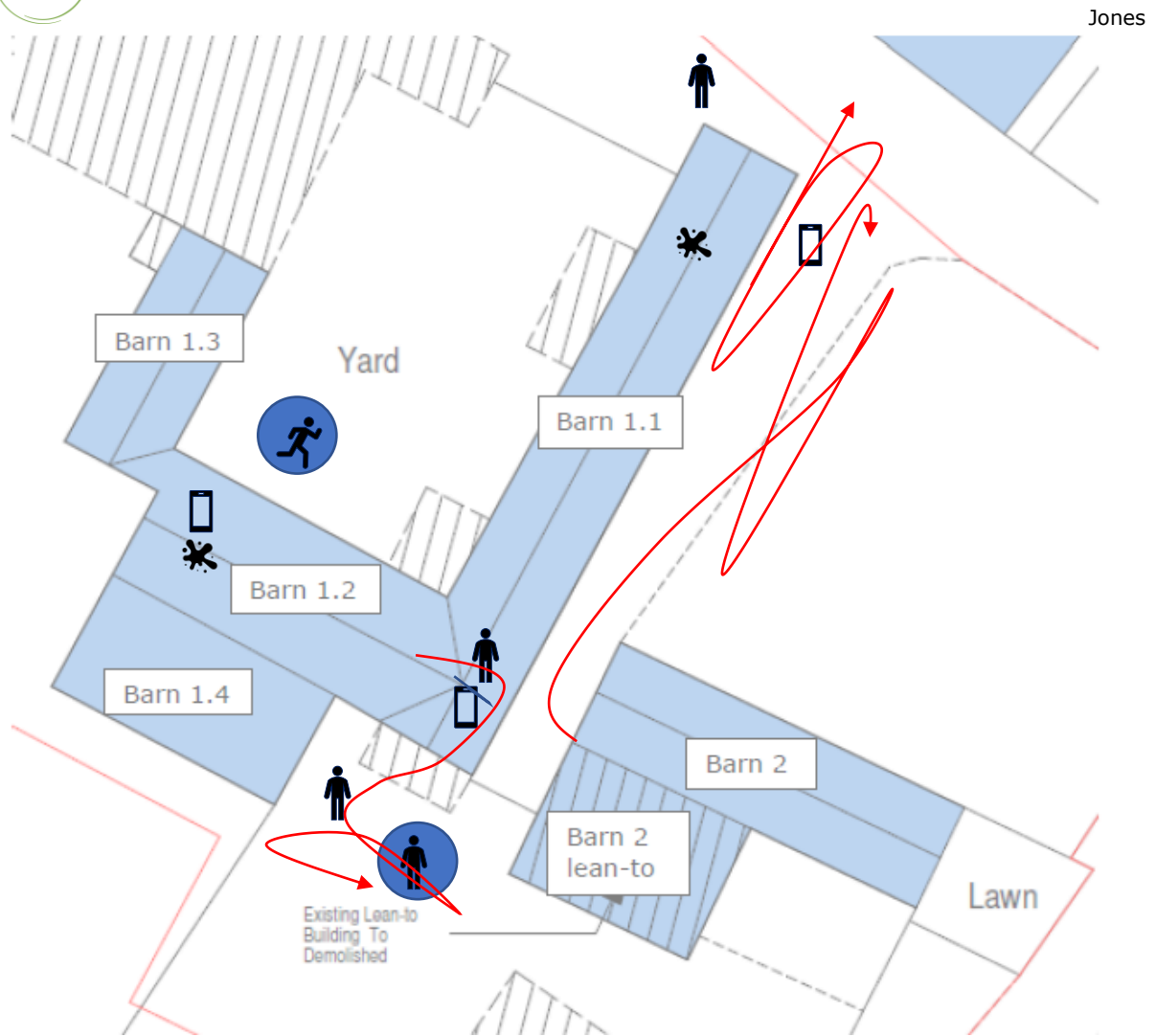


Figure 3.22. Survey area showing observations

Icon	Description
	Static Detector
	Stationary Surveyor survey 1
	Surveyor on Transect
	Surveyors survey 2

Icon	Description
	Roost Location
	Droppings Location
	Flight Paths

No bat activity was recorded from barn 1.4.



A soprano pipistrelle was recorded from barn 2

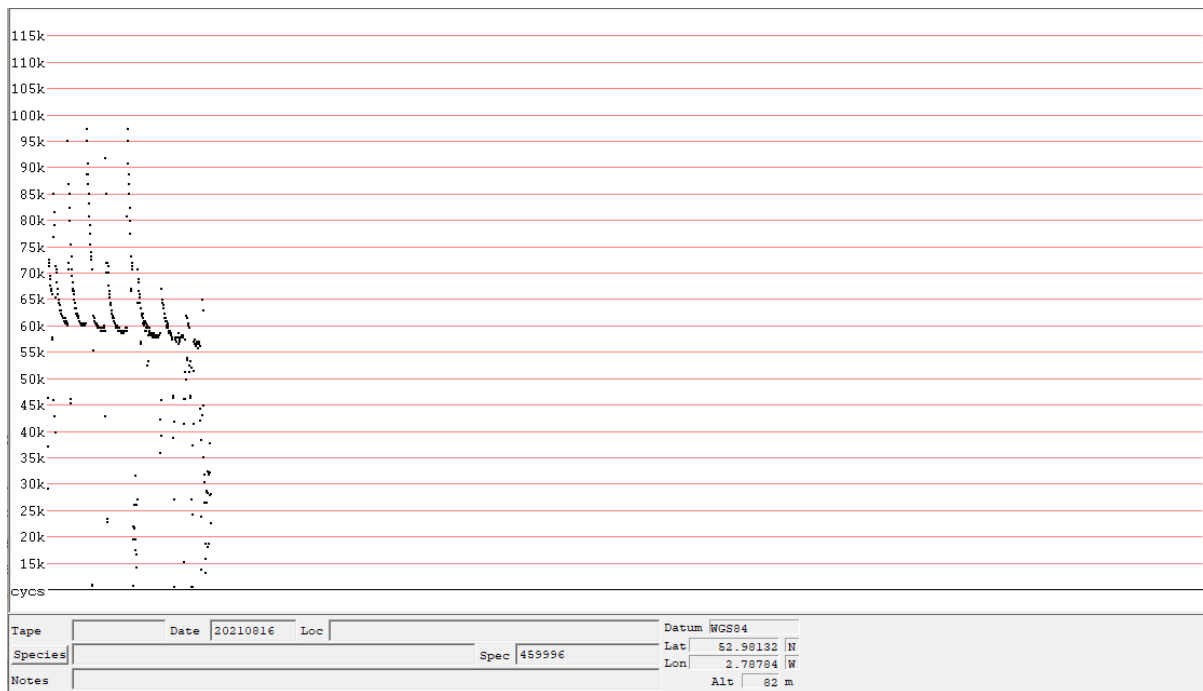


Figure 3.23. Soprano pipistrelle emergence from 16th August

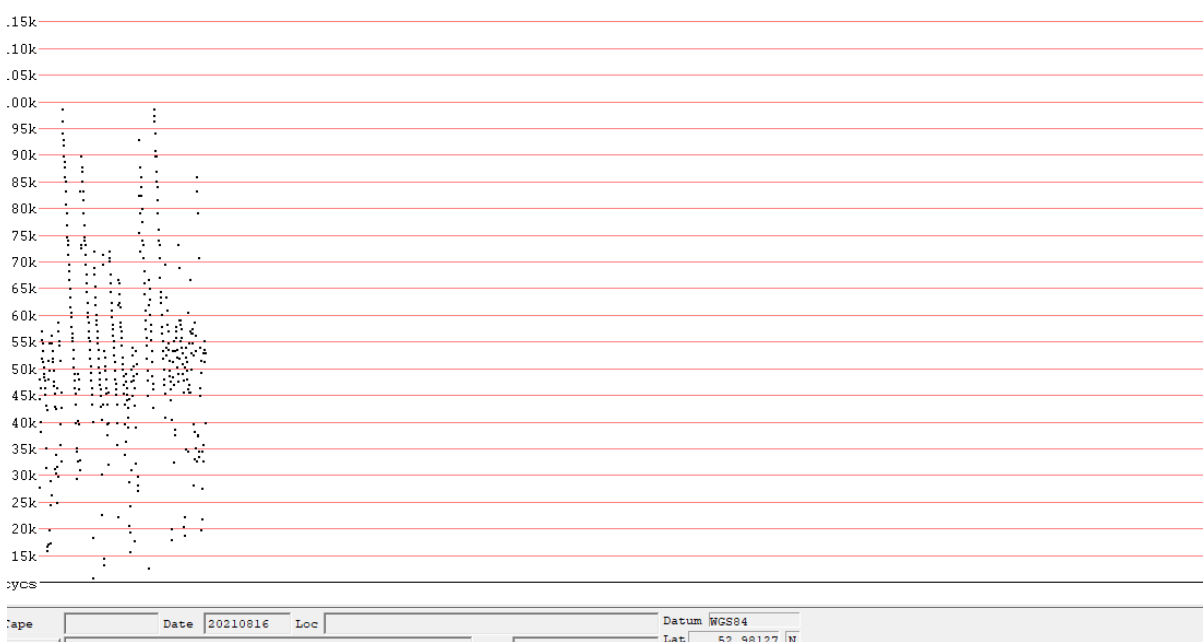


Figure 3.24. Natterer's bat



Summary

Emerging from building	Roost position
Soprano pipistrelle	In area 1.2, under central ridge
Brown long eared bat	In area 1.2 under central ridge
Natterers bat	In timber work in area 1.1 over mezzanine floor
Common pipistrelle	In barn 2
Soprano pipistrelle	In barn 2



Figure 3.25. Roost location summary

Comparison with results from 2018.

The same species in similar numbers were recorded in 2021, but in different locations. Clearly the roost sites have altered due to work on site, but these species need to be taken into consideration for ongoing work on site.



4 Bat Conservation Plan

4.1 Impacts

The bat mitigation has been planned combining the results of the 2018 and 2021 results. This means that four bat species across five roost locations will need to be licensed.

Without consideration, there will be the damage or destruction of roosts of brown long-eared bat, common pipistrelle (two roost locations), soprano pipistrelle bat and Natterer's bat. The roosts identified are all day roosts and are of low numbers. The bats may be using the buildings still during summer so there is also risk of harm to individual bats.

All four species are common and widespread and destruction of roosts for these species is of low ecological concern. Determination of conservation significance of roosts was taken from Figure 4: Guidelines for proportionate mitigation (Bat Mitigation Guidelines P. 39).

Work on these building would therefore be an offence and therefore remedial work on barns 1.1, and 1.2 and Barn 2 need to be conducted under mitigation licence from Natural Resources Wales. In places there are still opportunities for bats to come into contact with modern breathable membrane which is dangerous. Non-bitumastic linings contain small unbound fibres which can entangle bats leading to entrapment and eventual starvation.

It was proposed in 2021 that:

- Alternative roosts need to be provided prior to the development continuing.

This has been undertaken with bat boxes being erected on gable ends and in a nearby mature oak tree in the curtilage of the site.

Ongoing work – 2023 - will need:

- Supervision for soft demolition of roof on Barn 2 and bat exclusion from Barn 1 by the licenced bat worker
- Permanent exclusion of bats from being able to access the breathable membrane on 1.1 with the inclusion of timber battens under membrane and by exclusion at gable ends and under eaves. Allow access only to the bitumen hessian lining via ridge access points. Provide suitable gaps under the ridge tiles to allow bat access to the bitumen hessian alone.
- Provide a bat loft within Barn 2 with the building being re-roofed in slate with a bitumen hessian lining.
- As Barn 1.3 is now water tight and darker than before and therefore could be of greater value to bats, it should be included in the licence with exclusion ensured by the ECoW.

For roosts of low ecological significance there is no timing constraint for work. However the presence of the ecologist will be necessary in areas where there is greatest potential to disturb bats.

A conservation plan will need to be followed so that favourable conservation status of bats is maintained in the area.



4.2 Aims

The aims of the Conservation Plan (CP) are to:

- Protect habitats of ecological quality at the site.
- Conserve the species of ecological value at the site.
- Establish any maintenance and management responsibilities.

4.3 Objectives

The objectives of the CP are to:

- Minimise damage to adjacent habitats and protect habitats on site that are part of the final development.
- Ensure that no breach of British wildlife legislation occurs on site for the duration of the proposed development.

4.4 Ecological Issues and Legislation

The priority ecological issues, i.e. those that have legislative requirements or planning considerations and are relevant to the site and proposed works are as follows:

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 – as listed in:

- Schedule 2. European protected species of animals

The Wildlife and Countryside Act (1981) – as listed in:

- Schedule 5. Protected animals

Countryside and Rights of Way Act (2000)

Natural Environment and Rurality Communities (NERC) Act (2006)

4.5 Control of Works

To ensure that the works are undertaken in accordance with the Conservation Plan, a series of control measures will be utilised. The measures include:

1. Appointment of an ecological management team
2. Identification of ecologically sensitive areas and tasks using a risk zone

4.6 Ecological Management Team

The ecological management team will consist of the following posts:

- Ecological Clerk of Works (ECoW)
- Site Manager

The ecological management team will ensure that all site personnel are appropriately briefed on the ecological issues within the site. This will be undertaken through inclusion of ecological briefings within the toolbox talks given to all staff as part of the site induction process. The roles are detailed as follows:



Ecological Clerk of Works (ECoW)

- Develop method statements and site protocols.
- Provide guidance for the site team including legal and statutory requirements affecting works.
- Undertake toolbox talks and advise the site manager.
- Ensure site managers are aware of any changes.
- Monitor and report on the protective measures and habitats.
- Carry out audits to check for non-compliance with environmental legislation, consents, and objectives.
- Complete ECoW visit record sheet.

Site Manager

- Ensure the CP is developed and held on site and that it is implemented throughout all phases of the project.
- Ensure the site team and subcontractors comply with site protocols.
- Ensure the site and all stored materials and chemicals are safe and secure.
- Ensure the site is kept in a tidy and orderly fashion.
- Ensure all emergency protocols are up to date.
- Ensure all those that work on site have a site induction including briefing on environmental issues pertinent to the project and relevant toolbox talks.
- Ensure activities are carried out in accordance with the requirements of any associated method statements.

4.7 Ecological Control of Works

Table 4.1. Ecological sensitivity of works

Risk	Task / Area	Control
High importance	• Removal of the roofs and re-roofing • Repair of walls and timbers	• ECoW to provide method statements prior to work. • ECoW to give toolbox talk prior to works. • ECoW to ensure all ecological protection measures are in place prior to work commencing.
important	• Implementation of ecological mitigation features.	• ECoW to approve method statements prior to work commencing. • ECoW to give toolbox talk on proposed work and its impact on the ecology. • ECoW to check mitigation features
Least importance	• Restoration and conversion of the barn 1.3 • Works outside of ecologically sensitive areas or after ecological mitigation works.	• Works to be carried out to ecological best practice. • ECoW to approve method statements prior to work commencing. • ECoW to certify the works have been carried out according to pre-agreed plans and method statements.



4.8 Method Statement

1. Conversion and construction work will need to follow a rigid method statement. It will need to be conducted under a European Protected Species Licence (EPSL).
2. A suitably licensed ecologist will be employed as an Ecological Clerk of Works (ECoW) to oversee works in areas sensitive to bats and provide expert advice.
3. The licence can only be applied for when full planning permission has been granted.
4. A toolbox talk will be provided by the ECoW. The developer and any contractors will be made aware that there is a possibility that bats may be found during works, and will be advised to work in a way to ensure bats are not harmed during work in areas sensitive to bats; particularly around the gable ends and roofs and where ever it is deemed possible for occasional bat use such as mortar and mortice joints. They will be provided with a simple emergency procedure to follow if bats are found at any stage of the work on site. It will be ensured that the method statement is retained on site at all times.
5. Bats will always be allowed access to an undisturbed area during works- such as the bat boxes already erected on site.
6. A pre-commencement check will be conducted by the ECoW using a strong torch and borescope where appropriate.
7. Work in areas shown to support bats in surveys conducted in 2023 will be timed to when bats are least likely to be present, October- March where appropriate, and in areas where there are low numbers of bats, over summer when bats are most likely to be able to survive disturbance.
8. The removal of roofs will not take place if the temperature has been below 6°C for four consecutive days and nights.
9. The bat compensation will be created following the instructions in the EPS conservation scheme and the client will agree that any bat box erected must stay in place for a minimum of ten years post-development.

Barn 1.1

1. Barn 1.1 has been re-roofed with breathable membrane and a strip of bitumen hessian lining along the ridge. If modern breathable membrane is installed atop the bitumen, this will be removed.
2. Access for bats below the bitumen hessian lining will be limited by sandwiching the bitumen hessian with a batten on each side of the material. This stops bats being able to pass down below the 100mm of material.
 - a. These timbers will also run down wallplates to prevent bats gaining access from exterior gable walls.



Figure 4.1. Mock up of new timbers to be added to sandwich the bitumen hessian lining

3. Timber will be placed between the rafters to prevent bats entering up the bottom of the roof. This will be backed by insect guards to further ensure no available bat access.



Figure 4.2. Mock up showing bat access to the bottom of the roof being inhibited

4. Every fifth ridge tile will be raised to allow bat access to the ridge only.
5. Bat access along the verges will be restricted with mortar so bats cannot access the area with the breathable membrane.
6. Bats will be excluded using standard one-way gates where appropriate- this includes the mortice joints inside the barn and the brick work on the southern gable end where there are still gaps in the mortar. The one way gates will be erected with the assistance of the ECoW.
 - a. The one-way exclusion will be left in place for five days before being checked by the ECoW.
7. Once the building has been reroofed and bats excluded, bat access will be limited by sealing all doors and windows, thus reducing the potential for bats to re-enter where they are not expected.

Barn 1.2

1. Similar to Barn 1.1, access to the breathable membrane will be restricted with the use of battens and verge protection. If modern breathable membrane is installed atop the bitumen, this will be removed. The eaves will be restricted with the use of fascias and insect guards.
2. Every fifth ridge tile will be raised by 15mm to allow bats between the tiles and Bitumen hessian lining.
3. Once the building has been reroofed, bat access will be limited by sealing all doors and windows, thus reducing the potential for bats to re-enter where they are not expected.



Barn 1.3

1. Similar exclusion methods will be used in this building to Barn 1.1.

Barn 2

1. Barn 2 will be re-roofed with bitumen hessian lined slates. This will occur first so the bats in the area will have an alternative place to roost when work on Barn 1 recommences.
2. A bat loft will be prepared in barn 2. A loft floor will be installed (completed) and the loft space enhanced with appropriate roost features. The bat loft will be the extent of one section of the stables, 4mx5mx2m high.
3. Bat access through the slates will be provided with a lead tile shaped to allow bat access. The access will be 100mm wide, and 20mm high with a slot left in the slates below to allow bat access.
4. The felt will be slit behind this so bats can access the loft.



Figure 4.3. Bat access in slate roof constructed from lead.

5. Bat access will be created under the ridge by leaving one ridge in 5 slightly high at one end, with a 15mm gap below and mortar missing.



Figure 4.4. Lifted ridge tile

6. The ECoW will be present on site when the metal roof on Barn 2 is removed.
7. The bat provision in barn 2 will be checked prior to work in areas where there may be bats in other buildings.
8. The loft space will have a small personnel access hatch, so it can be checked for bat activity but not used for storage. This will be a 400mm² access.
9. Roost opportunities will be made inside the loft by creating crevices with rough-sawn timber, these will have an entry gap of 15mm.
10. The loft space will be insulated between the floor and ceiling and not under the tiles. This is the best method to keep the area the correct temperature for bats in summer.
11. Monitoring the roost will be required in years 2 and 5 following completion of the project.
12. Ongoing monitoring of the roost conditions will be aided by data loggers left inside the loft to monitor temperature and humidity.
 - If monitoring reveals the loft is unsuitable, modifications can be recommended to alter the conditions. For example, boarding out the loft with OSB would affect conditions if required.
13. Bat access will be maintained by keeping the eaves open.



4.8.1 In the event of a bat being found

8. If a bat is found by the ECoW then it will be gently captured by hand and placed in either a bat box, or the bat loft provided once it has been restored correctly.
9. If a bat is found when the ECoW is not present, work will stop immediately in that area and the ECoW contacted for advice. Work can continue in a different area, away from the bat.
10. The bat can only be handled by the ECoW or authorised person unless it is in immediate danger. The bat must be carefully placed in a well-ventilated lidded box with a small container (i.e. a plastic bottle lid) with water in it. The container must be kept in a quiet and safe place.
11. Care should be taken to avoid rousing the bat whilst transferring to a suitable location, such as a suitable roost box or alternative roost space that provides a safe, quiet environment with a stable cool temperature and relatively high humidity.
12. If the bat is underweight or injured it will be cared for by an experienced bat carer until such time that it is strong enough to be released into a suitable alternative replacement roost on site.



4.8.2 Compliance Audit

Where necessary, works as outlined will be conducted under a watching brief from the suitably experienced and licenced Ecological Clerk of Works (ECoW). This person will fill out a form on each visit to state what work has been overseen and what potential issues have been arisen, including how they were dealt with and what future work is required. This log will be kept on site throughout works and will be made available to any authorised person attending site wishing to see it. A form such as the example below will be used.

ECOLOGICAL CLERK OF WORKS DAILY RECORD SHEET

Site			
Personnel			

Date and Time	Issues/Location	Notes	Action required/by whom

Figure 4.5. Example record form

Work conducted under licence from Natural Resources Wales will also be audited, and will monitor general performance indicators relating to the licence. The example audit report template from NRW is found in Appendix D.



4.8.3 Compensation & Enhancements

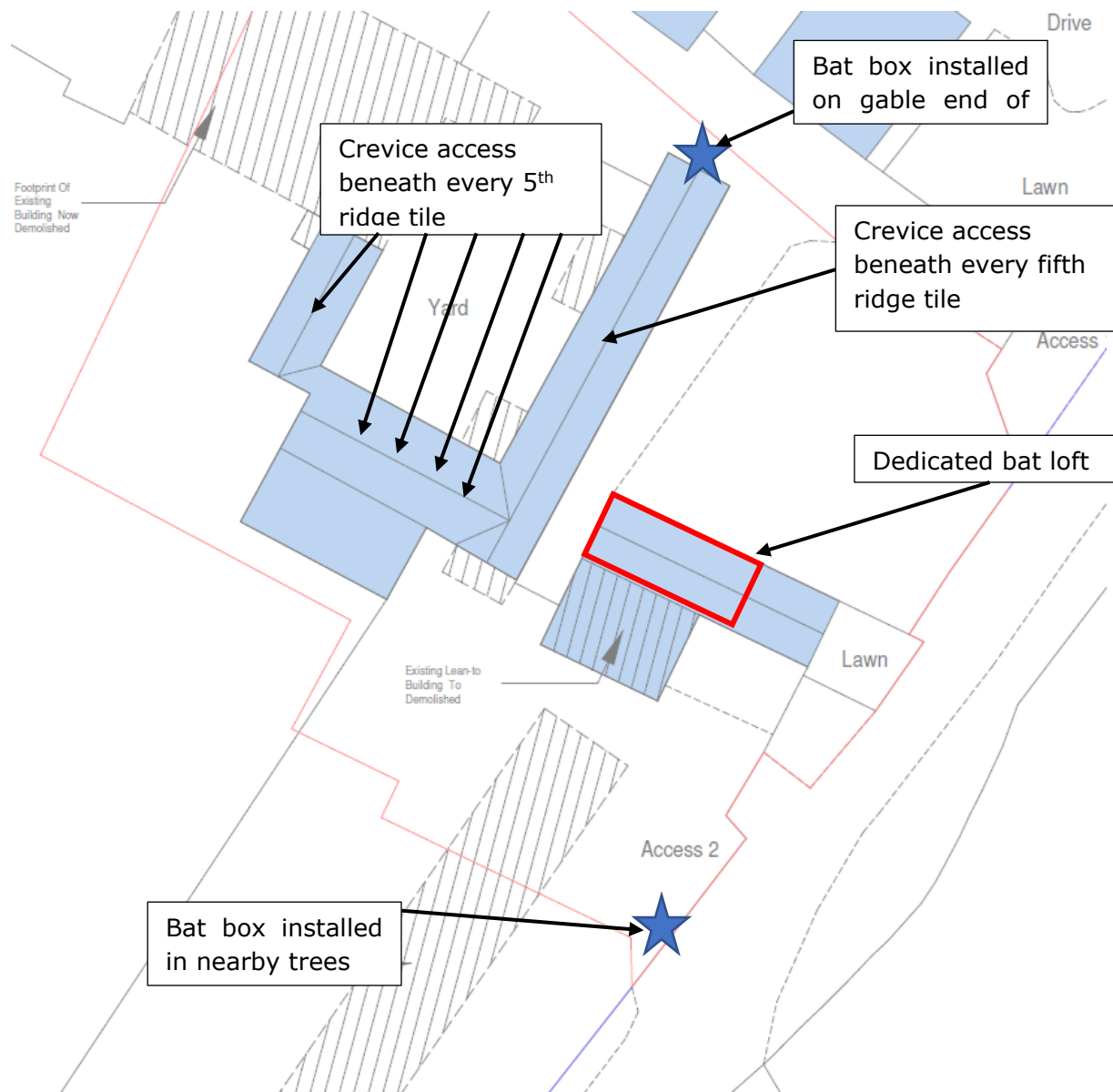


Figure 4.6. Bat Compensation Summary

Provision will be made for roosting opportunities for bats with the erection of at least one woodcrete bat box for each bat species, suitable for day roosts on a tree to the southeast of barn 2. A Schwegler 1FF box or equivalent will be erected.

These will be erected at a height of 3-4 m and in a westerly facing direction unless attached to the gable ends of the building.



Figure 4.7. Example woodcrete bat box: Schwegler 1FF



Bat access along ridge line

Bat access will be prepared along the ridge of barn 1.1, 1.2 and 1.3.

1. Strips of bitumen hessian lining have been included along the ridge of the barns with modern breathable membrane below. Access to the bitumen hessian felt will be made with a 15mm deep and 20mm wide gap will be left under five ridge tiles.
2. Bat access below the bitumen hessian will be limited with the addition of counter battening as indicated in the appended method statement from the client.



Figure 4.8. Showing approximate positions of bat access under ridge tiles on 1.2

3. A bat loft will be prepared in Barn 2 as outlined in section 4.8.



Figure 4.9. Mitigation on barn 2 and tree



1. A lighting scheme will be drawn up in line with ILP and BCT Guidance Note 08/18.
2. External lighting will illuminate the vegetated boundary to the southeast where a bat box will be installed.
3. There will be no direct illumination of any enhancement features erected for bats outlined in Figure 4.6.
4. All domestic lighting will be below 10 lux, orientated towards the ground and controlled by PIR (Passive Infra-red), set on a short timer.





4.8.4 Monitoring

As this site will involve low numbers of common species of bat, no monitoring is technically necessary. It is however recommended that a site survey is conducted one year after the work has been completed to see how successful the bat loft and bat boxes are, and years 2 and 5 for the bat loft.

The client will be expected to maintain these for a minimum of 10 years, and they be conserved in perpetuity with the details being provided in sales documents should the site change hands again.

Failing boxes or enhancements will be replaced at the cost of the developer if deterioration or damage is noted within five years post-development.



Appendix A – Surveyor Details

Table A.1. Details of surveyors' experience and licences held

Name	Membership of associations/ experience	Licenses
Peta Marshall BSc(hons)MA	Principal Consultant MCIEEM PIEMA Peta has a degree in Applied Biology and has been working in commercial environmental assessment for over 10 years. She has 10+ years' experience surveying for protected species. As a member of the CIEEM she is bound by professional conduct.	Holder of survey licenses for bats and newts in England and Wales. Registered Consultant for Mitigation Class Licence for Bats <u>England:</u> Bats - 2015-12200-CLS-CLS BMCL - RC084 GCN - 2015-18939-CLS-CLS Dormice - 2017-29225-CLS-CLS <u>Wales:</u> Bats – S087133-1 GCN – S087606-1
Ben Jones BSc(hons) MSc	Senior Consultant Ben has a degree in Marine and Freshwater biology and a Master's degree in "Managing the Environment". He has 7 years' experience conducting environmental appraisals and phase 2 surveys for bats and newts in England and Wales.	Holder of survey licenses for bats and newts in England and Wales. <u>England:</u> Bats - 2017-29112-CLS-CLS GCN - 2016-25209-CLS-CLS <u>Wales:</u> Bats – S088669-2 GCN – S087992-1
Brian Marshall	Technical Director FIEMA CEnv PEA Consultant with over 35 years in the Environmental Sector	
Chloe Sheil MZool (Conservation)	Chloe has a master's degree in Zoology with Conservation from Bangor University. She has 3 years' experience assisting with surveys.	Listed as an accredited agent on Ben Jones' NRW bat licence – S088669-2



Appendix B – Methodology

Species Surveys

Bats

Methodology used is in accordance with recommendations by BCT, Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition, Collins (2016).

Features on site were assessed for potential for bat roosts, foraging and commuting.

An external assessment of all structures on site was undertaken to determine potential roost features (PRF) The potential suitability of the structures assessed was assigned a rating of low to high in accordance with table 4.1 of Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition, Collins (2016).

An internal assessment of all structures was undertaken by a suitably licensed surveyor for evidence of roosting bats such as droppings, feeding remains and staining.

Daytime surveys were conducted with the aid of a strong torch and a pair of Pentax Papilio 8.5x21 close focus binoculars. Bat species may leave little evidence of their presence.

Evidence for the presence of bats includes:

- Holes, cracks and rot holes used as roosts, marked by streaks of urine and faeces.
- Smoothed, darkened edges where bats have rubbed and left natural body oils when entering and exiting a space.
- Faeces under a roof access point, a well-used feeding point or a resting spot.
- Feeding signs such as discarded insect wings under a feeding point.
- Lack of cobwebs around eaves, roof spaces, beams or ceilings where routes are kept clear by bats or presence of droppings in a cobweb.
- Presence of roosting or dead bats in or behind any object.

Phase 2 bat activity surveys were conducted to reinforce the findings using heterodyne and frequency division bat detectors (Anabat SD1 and 2, Anabat Walkabout)

Surveys were conducted when the weather conditions were suitable for bat activity, i.e. when the ambient temperature exceeded 10°C at sunset and when there was little or no rain. Dusk surveys were begun approximately 15mins prior to sunset and continued for 90-120mins following sunset depending on visibility and site conditions.

The survey in February 2023 was conducted when bats are likely to be hibernating.

Activity surveys are conducted to establish the presence of bats within a structure, what species they are, approximately how many are present, and if possible, where they are exiting a roost.

Bats were identified from the characteristic echolocation calls using appropriate computer sonogram analysis software.



Appendix C – Policy

The following areas of policy and legislation are of relevance to ecology and provide context to the surveys conducted. Findings presented in this report are in line with the following:

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 – as listed in:

- Schedule 2. European protected species of animals

The Wildlife and Countryside Act (1981) – as listed in:

- Schedule 1. Birds protected by special penalties at all times
- Schedule 5. Protected animals

Countryside and Rights of Way Act (2000)

Natural Environment and Rural Communities (NERC) Act (2006)

Bats

All bat species are protected under The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 which implements the EC Directive 92/43/EEC in the United Kingdom. It is an offence, with certain exceptions, to:

- Deliberately capture or kill any wild animal of a European Protected Species.
- Deliberately disturb any such animal.
- Damage or destroy a breeding site or resting place of such a wild animal.
- Keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal or plant of a European Protected Species, or any part of, or anything derived from such a wild animal or plant.

A person found guilty of an offence is liable on summary conviction to imprisonment for a term not exceeding six months or to an unlimited fine or to both.

Seven bat species are on the UK Biodiversity Action Plan and are listed as Species of Principal Importance under the provisions of the Natural Environment and Rural Communities (NERC) Act 2006. The National Planning Policy Framework (NPPF) states that to minimise impacts on biodiversity and geodiversity, *“planning policies should... promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations”*.

To allow a development that might result in an offence, a derogation licence can be sought via the implementation of a European Protected Species Licence. This is provided by Natural England.

Work can be conducted under a derogation licence from Natural Resources Wales providing suitable compensation and mitigation is provided and the “three tests” can be met. These are:

Regulation 55(2)(e) states: a licence can be granted for the purposes of “preserving public health or public safety” or other imperative reason of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.

Regulation 55(9)(a) States: the appropriate authority (Natural Resources Wales) shall not grant a licence unless they are satisfied “that there is no satisfactory alternative”



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Regulation 55(9)(b) states that the appropriate authority shall not grant a licence unless they are satisfied "that the action licensed will not be detrimental to the maintenance of the population of the species concerned at favourable conservation status in its natural range."

The method statement in the EPS licence is a legally binding document which outlines the species, context of the colony, method of mitigating and compensating and ongoing habitat management for ensuring favourable conservation status.



Appendix D – Example Compliance Audit Form

No	Performance Indicator	Evidence Required - this list should be adapted to reflect the agreed method statement.	Pass (Yes/No), Comments	What action is required as a result of findings?
	General			
1	The licensee will advise NRW Species Officer of the start date for the works prior to works commencing.	Written or electronic documentation with notification of start of works.		
2	A suitably experienced licensed ecologist will be appointed and retained during the life time of this licence to provide on-site advice.	Letter, contract or other document outlining the appointment of an ecologist for the lifetime of the project.		
3	Prior to the start of any works on site, all site workers will be inducted by the project ecologist. This induction will cover the legal status of the species, the method of working and, action to be taken if protected species are encountered.	Copy of documents from ecological induction, showing induction content and detailing contact numbers and contingency procedures should be found during the course of works. List of induction attendees.		
4	Preparation and implementation of a biosecurity risk assessment as detailed in E.5 of the method statement	Biosecurity risk assessment is available for inspection. Log of biosecurity measures is available for inspection and shows that they have been implemented. Field observation shows that biosecurity measures are in place e.g. anti-fungal spray		



	Licence available for inspection by any police constable, employee of the Welsh Assembly Government or employee of the Countryside Council for Wales or authorised persons on demand.	Licence is available for inspection on site		
	No agent of the licensee shall act under licence unless they are in possession of a letter signed by the licensee appointing them by name as the duly accredited agent of the licensee for the purposes of this licence, and shall carry with them the said letter and a copy of this licence and shall produce them to any police constable or employee of the Natural Resources Wales or other authorised person on demand	All relevant accredited agents have copies of licence holder's letter of authorization. Licence holder's letter is available for inspection.		
	E.1 Bat disturbance, capture and exclusion			



5	Works affecting bat roosts will not commence until the Project Ecologist has inspected the area and confirmed that work can go ahead – as detailed in E.1 of the method statement.	Log and field observation show disturbance, capture and exclusion (as relevant) have been undertaken as detailed in the method statement. Dates of action taken should be noted. ECOW will check that the baffle is in place sufficiently that bats cannot come into contact with BRM. No gaps greater than 8mm will be present. Remediation will be checked where this key performance indicator is not met. Facia boards along the sides for the buildings will be checked Examples of actions to be included - - timing of observations and methods used to confirm if bats still present - details of exclusions or deterrent methods used		
6	Action taken if bats found during the course of work	Log detailing - number and species of bats found and location - actions undertaken if animals found		
	E.2 Bat roost and habitat retention, modification and / or creation			
7	<u>Retention of existing roost/s</u> and features (minor changes and maintenance works) as detailed in E.2.1 of the method statement.	Log and field observation demonstrate retention is in accordance with method statement including: - type of replacement roofing material - specification of roofing membrane - use of appropriate timber treatment chemicals & works timed to avoid injury - addition / changes to insulation and impact on temperature/humidity. - retention or modification of roost entrances - enhancements to the roosts e.g. crevice provision		
8	<u>Modification of existing roosts</u> as detailed in E.2.2 of the method statement	Log and field observation demonstrate modification was in accordance with Method Statement including: - number, location and dimensions of roost areas, including partitioning of roof voids - construction materials (e.g. roofing membranes, roofing material) - number, location and design of entrances - provision of roost crevices - use of appropriate timber treatment chemicals & works timed to avoid injury		



		- lighting scheme to avoid illumination of roosts/ entrances - installation of services that may require maintenance		
9	<u>Creation of new roosts</u> (including bat houses and bat boxes) as detailed in E.2.3 of the method statement	Log and field observation demonstrate construction and installation was in accordance with Method Statement including: - number, location and dimension of roost areas - construction materials (e.g. roofing membranes, roofing material) - number, design & location of entrances - number, design & location of roost crevices - number, location and design of bat boxes as specified (e.g. make & model number) - lighting scheme avoids illumination of roosts / entrances - replacement roost in good order and ready for occupation (or occupied) before old roost damaged or destroyed		
10	<u>Retention &/or modification of existing and creation of new habitat</u> as detailed in E.2.4 of the method statement	Log and field observation demonstrate retention, modification or creation was in accordance with Method Statement including: - measures to ensure that existing bat habitat (e.g. vegetation features close to roosts and/or used as flightlines, foraging habitat) have been retained and not damaged during construction. for new or modified habitat: - design, habitat type, planting schemes & locations; - provenance of imported plants & biosecurity considerations		
	F and H Post-development site safeguard			
11	Implementation of <u>roost site / bat habitat management / maintenance and monitoring</u> as detailed in F.1 and F.2 of the method statement	If audit undertaken during <u>development phase</u>: - Habitat/site management plan demonstrates measures are in place to ensure ongoing maintenance of roost site/s and management of habitat (retained, modified and newly created) post-development and rectifying errors &/or ineffective mitigation including: - responsibility for and funding for roost site maintenance and management - maintenance and retention of existing bat habitat features replacement of material that has failed within 2 months If audit undertaken <u>post development</u>:		



		- log or report demonstrate roost site management plan has been implemented - site management works are maintaining the ecological functionality of the mitigation/compensation site		
12	Implementation of <u>population monitoring</u> as detailed in F.2 of the method statement	If audit undertaken <u>during the development phase</u>: - monitoring plan demonstrates measures are in place to undertake bat population monitoring post-development. If audit undertaken <u>post-development</u>: - log or report demonstrate monitoring plan has been implemented - log or report demonstrate results passed to local record centre		
13	Implementation of <u>long term site safeguard proposals</u> as detailed in F.4, H.1 and H.2 of the method statement <i>NB Not all schemes will require all of the activities</i>	Log of works demonstrates implementation eg: (i) land transfer or other legal interest proposal (ii) mitigation/compensation site been listed as a local land charge (iii) proposed legal agreements and contracts been completed (iv) wardening requirements implemented to proposed timescales and in accordance with the submitted Method Statement (v) financial plan in place to resource mitigation, compensation, monitoring, site management or wardening		
14	Any other points to note/comments from auditor:			



Appendix E – Method for excluding bats from breathable membrane – Client's letter to NRW.

The below text and photographs were written and provided by the client. The following text was not authored, and the photographs not taken, by Greenscape Environmental Ltd. The following has been assessed and commented upon by NRW and Wrexham County Council and the method statements in the main body of this report have been amended to address points raised. The below is therefore informative only of the historical suggestion and discussion, and details presented in Section 4 – Bat Conservation Plan of this report should be primarily followed.

We have been made aware that the breathable roofing membrane that has been used on the barn roof is dangerous to bats, causing entrapment and death.

At present, the roof consists of BRM (breathable roofing membrane) for the most part, and Bitumen Hessian covering the ridge and approximately 100cm down from the ridge on barn 1.2, 1.3 on each side. And the west end gable end of barn 1.1.

It has been suggested that if we could present a solution to prevent the bats getting to the BRM then it may be adequate for the mitigation.

Our solution is to fit a piece of timber internally, between each of the rafters, sandwiching the Bitumen between the new timber and the external roofing lat / batten.

I have referenced the Scottish natural heritage document : preventing bat access in domestic dwelling houses annex ii. It states "Bats can use gaps as small as 8mm so all gaps or holes this size or bigger would need to be sealed"

Therefor we have built a mock up of our roof, and demonstrated the idea of a piece of timber between each rafter. I then used an 8mm drill bit to prove that anything 8mm or larger would not be able to pass the section where the bitumen is sandwiched between the timber and the lat / batten.

This timber would be place internally, underneath the lowest lat / batten that does not have BRM. Therefor sealing the top section of the roof, with the bitumen, from the lower part of the roof which has the BRM.

The lower part of the roof would be sealed off in a similar fashion, a piece of fascia board would be cut to fit between the rafters and pushed up to sandwich the BRM between the fascia board and the roofing lat / batten. The remaining BRM can be cut away with a sharp knife. The fascia board can be sealed against the brick work with a suitable silicone / adhesive / sealant / foam. Ventilation as required by building regulations can still be achieved with vent grilles or mesh with holes smaller than 8mm.

I believe this solution would completely prevent bats becoming entrapped by BRM, whilst still providing a large area for the bats in the top quarter section of the roof, accessed by the slightly raised ridge tiles as per the mitigation report.

Internally, between the rafters there will be a 25mm air gap and 100mm of Kingspan insulation , the rafter depth will be increased to accommodate the insulation. Then plasterboard will be fixed to the rafters. The insulation would be tight against the new timber, so if a bat where to get under the bitumen felt, it would still not be able to get to the breathable membrane. Please look closely at the following photographs. If you have any questions, please do not hesitate to contact me.

Thomas Jones.

tomcolinjones@gmail.com

07369 256660



photo showing the existing roof with the BRM (white) and the Bitumen (grey / black)



the 8 mm drill bit used to test the potential for bat access



demonstrating how the bitumen currently sags and would allow bats to get through.





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showing the new section of timber in place, directly opposite the roofing lat / batten.
Sandwiching the bitumen .



showing the gap has disappeared with use of the timber insert.



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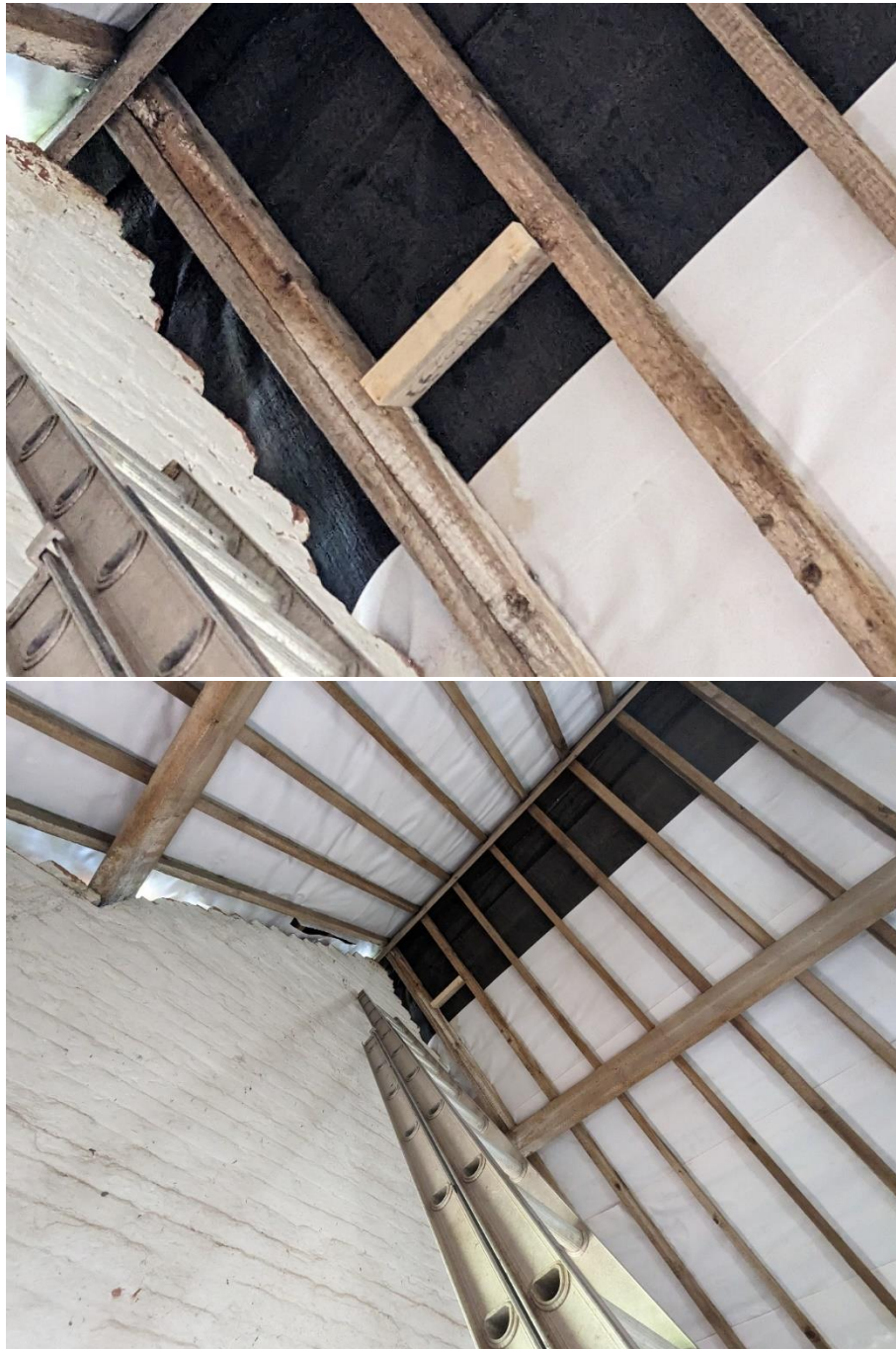
Showing that there is not enough space for bats to access the BRM through the slates.



showing the timber fascia board blocking off access to the lower roof.



Showing that an 8mm drill bit cannot get through the gap.



Showing the timber in place.



Jones





Appendix F - Bibliography

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