



<http://www.tyrer-ecologicalconsultants.co.uk>

<http://www.facebook.com/ecologicalsurvey>

Formby Business Centre, 42 Duke Street, Formby, Merseyside, L37 4AT

Tel: 01704 875781 Mobile: 07719 108429

Email address: stan@tyrer-ecologicalconsultants.co.uk
kylee@tyrer-ecologicalconsultants.co.uk

Mill Cottage, Marchwiell Hall, Wrexham, LL13 0SS
National Grid Reference: SJ 34056 48271

Inspection & Assessment in Relation to Bats & Breeding Birds
Including Dusk Survey Results

Prepared for:

Blueprint Architectural Services
Office 3K4
Redwither Tower
Redwither Business Park
Wrexham
LL13 9XT

Issued : 10th November 2015



Summary

Extensive works are required at Mill Cottage, which is located within the Marchwiel Estate, Wrexham; the work involves restoring the existing structure into a habitable condition; the living space will be extended into the former water wheel housing; in addition three outbuildings will be demolished. Consequentially as part of the planning application process Blueprint Architectural Services on behalf of the site owner commissioned The Tyrer Partnership (Ecological Consultants) to undertake an initial daytime survey to ascertain its value in relation to bat roost potential/nesting birds and if evidence of use was present; this was conducted on 23rd of September 2015.

The inspection revealed that the interior of the building is in a deteriorating condition and a small loft space is present which was found to be of restrictive dimensions; Underfelt was noted beneath the roof slates, which where present and access is available can provide opportunities for crevice dwelling bat species, whereby they will roost between the two materials. In addition to this numerous opportunities for ingress by bat species is present.

The external inspection located numerous potential ingress points for crevice dwelling bats at external features and are typical places often favoured by crevice dwelling species such as the Pipistrelle.

The habitat immediate to the surveyed building is more than capable of meeting the foraging requirements of several bat species; the abundance of potential access opportunities for bats combined with evidence of bat use, a confirmed roost and the productivity of the immediate habitat will instigated recommendations for dusk/dawn surveys prior to any work being undertaken at the site. Hibernation potential has further been identified and additional surveys relative to hibernation will be recommended.

At Mill cottage and associated mill pit evidence of bat use has been confirmed by way of more than one species, the number of droppings present at the cottage is indicative of a maternity roost. The collective combination of the cottage, mill section and mill pit contains roost potential for more than one roost purpose including hibernation, notably for the latter within the mill pit itself.

In respect to the outbuildings, two of the three were entirely devoid of roosting potential for bats due to their construction, however, the brick built outbuilding was found to offer numerous areas which could be utilised by bats but an investigation was deemed structurally unsafe. Its continuing deterioration will over time reduce it is ability able to meet the roosting requirements of bats although currently it appears that bat roost potential for singular bats may be internally/externally present.

Lighting is currently at a low level at Mill Cottage itself and is absent in the immediacy. Should the plans involve exterior lighting schemes this may impact on bat species present.

No evidence was found to suggest recent present of breeding birds however opportunities which could be utilised as nesting platforms are present within the dilapidated outbuilding and surrounding trees.



The recommended further surveys were carried out in the form of two dusk emergence surveys and one dawn survey spanning over July and August of 2016. The surveys found that three bat species were present roosting in Mill Cottage with the attained information detailing the presence of a small Brown Long Eared Bat maternity roost and a day roost of the Common Pipistrelle bat as well as a day roost for a singular whiskered Brandt's bat. As such, the presence and destruction of three bat roosts will need to be addressed from both a conservation and legal perspective along with appropriate mitigation prior to the undertaking of any proposed works with the results detailed in sections 11 and 12 of this report.



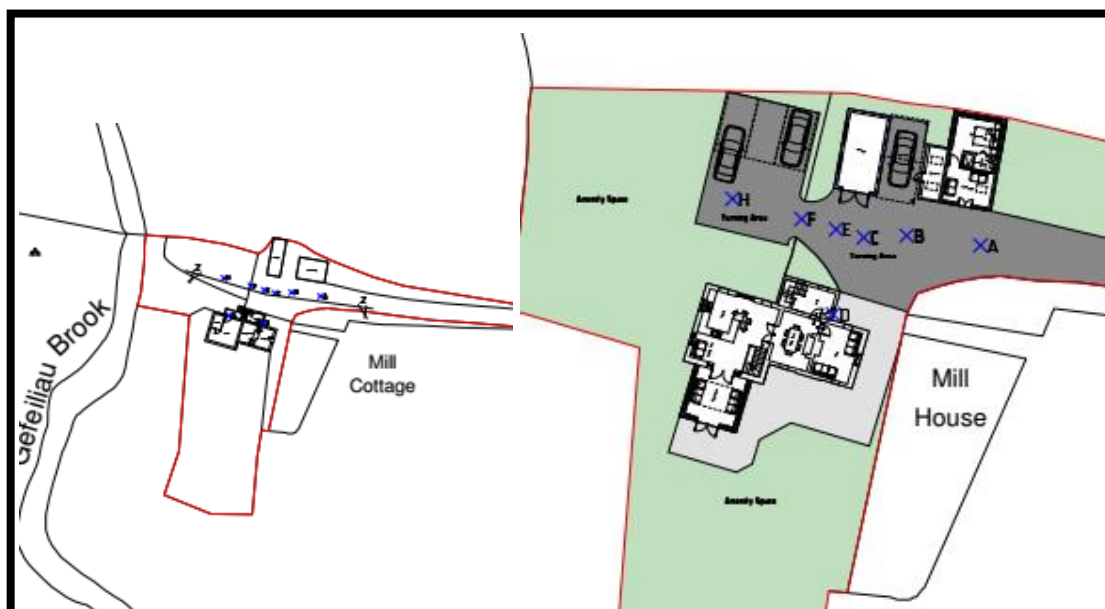
Table of Contents

1. Introduction and Reasons for Survey.....	
2. Protected Species & Their Requirements.....	
3. Protected species in North Wales.....	
4. Survey Methodology	
5. Constraints	
6. Daytime Survey Results.....	
7. Daytime Survey Conclusions	
8. Daytime Recommendations & Implications.....	

APPENDIX I - Site Photographs

1.0 Introduction & Reason for Survey

- 1.1 As part of a proposed planning application at Mill Cottage, Marchwiel Estate, Wrexham, an initial survey comprising of inspection and assessment was undertaken in relation to bats and breeding birds. It is understood that the proposals involve extensive work to both the exterior and interior of Mill Cottage which will restore the structure into a habitable condition; additionally, the plans entail the remodelling of the current layout with the extension of the existing living space into the former water wheel housing; in addition outbuildings will be demolished. As part of the Local Authority's Planning Policies ecological surveys are generally required, particularly where a specially protected species is or may be present and could be affected by the proposals for which the Application seeks consent.



Existing site plan

Proposed site Plan

- 1.2 The aim of the inspection was to initially ascertain if the building/s is of value to bats/breeding birds if it was found to be suitable for either species, signs of bat use were located or the survey was inconclusive then more detailed bat surveys would be recommended i.e. dusk/dawn emergence/re-entry surveys during the main active season of bats which is May – August. If bat/s or their roost/place of rest/shelter is subsequently affected by the work then a licence would be required to legally proceed with the development, Natural Resources Wales, in exercise of the powers conferred under regulation 53(1) and 56(3) (a) of the Conservation of Habitats and Species, Regulations 2010 may issue licences for the following purposes:

- The activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety



- There must be no satisfactory alternative; and
- The favourable conservation status of the species must be maintained.

1.3 The optimum time to investigate any structure for evidence of a bat roost is May – August, however that is not to say they cannot be inspected and assessed outside of that time and frequently the results can be conclusive, which can save time and expense for Planning Applicants. It should be borne in mind that equally the inspection can be inconclusive. In relation to breeding birds the most conclusive time to carry out the investigation is between March and August however evidence of nesting can be present year round in the form of remnant nests and droppings.

2.0 Protected Species

2.1 All British bats and their **roosts are afforded protection under the 1981 Wildlife & Countryside Act (as amended) and are listed in Schedule 2 of the Conservation of Habitats & Species Regulations 2010 (as amended). When dealing with cases where a European Protected Species (all UK bats) may be affected, a planning authority is a competent authority within the meaning of the Regulation 7 of the 2010 Regulations and therefore has a statutory duty to have due regard to the provisions of the Regulations in the exercise of its functions.

2.2 *Planning Policy Wales* (PPW) (2002) sets out the land use planning policies of the Welsh Government (WG). It is supplemented by a series of Technical Advice Notes (TANs). Procedural advice is given in National Assembly for Wales / Welsh Office circulars. PPW, Ministerial Interim Planning Policy Statements (MIPPS), the TANs and circulars together comprise national planning policy to which local planning authorities in Wales must have regard in the preparation of development plans.

2.3 Detailed advice on the preparation of unitary development plans (UDPs) is contained in *Unitary Development Plans Wales*, 2001. Detailed advice on the preparation of Local Development Plans (LDPs) under the Planning and Compulsory Purchase Act 2004 is given in *Local Development Plans Wales*, 2005.

2.4 Technical Advice Note (TAN 5 2009) provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. This guidance note should be read in conjunction with *Planning Policy Wales* (2002), in particular with Chapter 5 *Conserving and Improving the Natural Heritage and Coast* which sets out the Assembly Governments objectives for the natural heritage and the land use planning policies which support these.

When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:-

If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused

2.5 Use of Buildings by Bats

- a) Summer breeding roost.
- b) Hibernation.



c) Transitional or temporary roost.

Roost selection is often closely correlated to suitable foraging habitat within a reasonable commuting distance from the roost and different sites are used depending upon insect densities and abundance, climatic conditions can also affect their ability to successfully forage. All British bats are insectivorous.

** The term roost is generically referred to as a place that bat/s use for the any of the above reasons, however it should be noted that under the Conservation of Habitats & Species Regulations 2010 (Regulation 41) the term roost is not used but refers to “a *breeding site or resting place of such an animal*” and is afforded legal protection. The roost, breeding site or resting place of bats, which ever terminology is used is legally protected whether or not bats are in occupation.

- 2.6 All wild birds (with only minor exceptions) and their nests whilst being built or containing eggs or dependant young are protected under the Wildlife & Countryside Act 1981 (as amended). Birds listed on Schedule 1 e.g. barn owls are afforded a greater level of protection. Where nesting birds are present then work should be timed outside of the nesting season (March – August) so as to avoid disturbance.
- 2.7 Barn owls (*Tyto alba*) are a specially protected as a Schedule 1 Part 1 species under the 1981 Wildlife & Countryside Act (as amended), which gives protection to barn owls at all times. The main points in relation to nest sites are: “It is offence to intentionally or recklessly disturb them at or near a nest containing eggs or young. Intentionally damage or destroy a barn owl nest whilst in use or being prepared for use. It is also an offence to intentionally or recklessly disturb dependant young of a wild barn owl.”
- 2.8 Within buildings adaption to artificial nest boxes occurs given that suitable habitat exists within feeding range and linear features such as hedgerow, ditches or watercourses are present as links to other areas, which allows the expansion of young barn owls looking for territories. The boxes can serve both as a breeding site and as a place for general roosting or shelter.
- 2.9 Barn owls are essentially a bird of the open countryside, particularly where rough grassland exists, which supports their main prey by way of small mammals and successful breeding is heavily dependent upon 1) a secluded nest site and 2) a plentiful supply of prey being available. It is possible that loss of an occupied nest site can have an adverse effect even if other alternative sites were made available. Thus where possible it is always preferable to retain an occupied site and not take the approach of providing an alternative in a different location.

3.0 Protected Species in North Wales

- 3.1 Up to eleven bat species have been recorded in North Wales most of which use built structures, notably occupied residential properties, for roosting. The most frequently encountered species is the Pipistrelle bat (*Pipistrellus*) and its abundant status in North Wales is reflected throughout the UK. Barn owls are typically found in mainly lowland farmland habitat within Wales but will also use semi-upland features where there is a combination of suitable habitat and nest sites.



4.0 Survey Methodology

- 4.1 The daytime survey was conducted on 23rd September 2015 when the buildings that will be subject to the aforementioned work were inspected for potential places that may be of value to bats and if evidence of use was present. The Mill features a loft space which, due to safety constraints, was investigated via the hatch opening only; a high powered torch was used to ascertain signs of bat use that could include droppings, urine splatters, stains on beams and feeding remains. Similarly the upper floor of the wheel housing and outbuildings were investigated, although loft spaces are absent within the outbuildings.
- 4.2 The exterior elevations were investigated from ground floor level, with the aid of close focussing binoculars, for places that are frequently used by bats as roosts or as access into roost chambers.
- 4.3 The inspection in relation to breeding birds was carried out in tandem with the bat inspection.
- 4.4 The survey was conducted by Ms K. Swift MSc, an experienced surveyor, who is an accredited agent on the Class 2 Bat Licence of Mr Stan Irwin who has thirty years of bat ecology experience, additionally and more relevant to the survey location Ms Swift is also an accredited agent on the NRW bat licence held by Mr S Irwin (51880: OTH: CSAB: 2014). The results, conclusions, and recommendations have been assessed by Mr Irwin and his assessment concurs with that of Ms Swift.
- 4.5 The results, conclusions and recommendations are based on a number of factors i.e.
- Practical experience of surveyor
 - Knowledge of bat/bird species relevant to the site location and geographical distribution
 - Nature of the immediate and surrounding habitat in relation to foraging opportunities
 - Condition of the buildings
 - Presence/absence of a loft space
 - Presence/absence of roost/nesting potential
 - Value of roost/nesting potential – if present
- 4.6 During the survey the surrounding habitat was evaluated in relation to bats as very often roost selection is closely correlated with the surrounding habitat.

5.0 Constraints

- 5.1 The inspection was undertaken at a time when bats are within a transitional phase towards the end of their breeding season but not yet hibernating when maternity colonies will have largely dispersed, and as a result the presence of bat droppings, on external elevations, which may have been deposited during the summer months, tends to be more unlikely due to the effects of wind and rain. However, in relation to assessing the level of bat roost potential a full and unrestricted investigation of buildings was achievable. Birds are also largely outside of their breeding season at this time, however evidence of nesting especially within the 2015 season will largely still be visible.
- 5.2 Due to the restrictive nature and level of insulation within the loft space at Mill Cottage access was not achievable into this area, and therefore was inspected from the access hatch at ladder level. Despite the aforementioned constraint a full



inspection and assessment of the buildings suitability for bats/birds could be ascertained.

- 5.3 Notwithstanding the above constraint it is considered that it was not sufficiently significant relative to preventing the gathering of information on which to base conclusions and recommendations.

6.0 Daytime Results - Bats

- 6.1 Mill Cottage is located within the Marchwiel estate that consists of large country parkland comprising of approximately 150 acres of woodland farmland and mature gardens. The Cottage is a Grade two listed building which up until two years ago had been tenanted by a retired employee of the estate. It is accessed from the busy A525 located at just less than two kilometres south of Wrexham town centre within a rural environment notably amid mixed woodland close to Gefeilliau Brook. Sontley Marsh SSSI which is noted for its diverse invertebrate community lies < 100 metres from the boundary of the proposed development along with the River Clywedog (LBAP Habitat) at 171 metres south of the site boundary. Collectively, the aforementioned semi-and natural features represent a long standing ecological network of high value; as a result it will provide connectivity and a highly suitable habitat for bats and breeding birds.
- 6.2 The habitat in close proximity to the site is optimal for many wildlife species including those for which the survey was undertaken; it includes dense mixed broadleaved and coniferous woodland and a large mill pond; all of which are considered to be highly productive in terms of foraging habitat for most bat species. Encompassing the site are numerous small patches of woodland which along with the site itself are currently unaffected by artificial light.
- 6.3 As identified, the habitat as described can be considered to be of high value for the species for which the survey was undertaken i.e. bats and breeding birds; the open pasture woodland and agricultural land within the wider landscape provides a high level of favourable hunting grounds for barn owls, and where this landscape is present close to buildings the percentage use of those buildings, by bats/breeding birds increases given that roost/nesting opportunities are available and vice versa.



Location of Mill Cottage shown in red within the immediate/extending habitat

- 6.4 Mill Cottage, a prior residence which originally encompassed the former Marchwiel water mill has not housed a wheel or any such machinery for a number of years following significant fire damage in 1940. Marchwiel Mill and Mill Cottage are jointly Grade two listed circa 1996, due to the highly decorative example of a 1840s estate cottage and former mill. The building referred to as Mill Cottage is predominantly single storey with a section of the living accommodation incorporated within the roof space; it is of brick construction, a pitched Welsh slate roof with a mock timber frame and dentil cornice. Due to the building having been unoccupied for some time, it is internally in a poor decorative state with extensive remedial and modernisation work required to restore the structure into a habitable condition in line with today's modern energy efficient standards; structurally however, the building appears to be in reasonable condition.
- 6.5 Despite a section of the roof space, which is purlin and rafter construction, providing additional living accommodation, a loft space to approximate dimensions of 9 metres long x 3 metres wide x 1.3 metres high is present along with extensive insulation, which as a consequence raised concerns about entering the loft as roof joists were completely obscured; notwithstanding this constraint it was noted that underfelt lines the roof slates. Conditions within the loft are total darkness with an absence of draughts and as a result will, in theory, be of benefit to bats although because of its very limited and restricted height the potential for loft dwelling bats is reduced but because of its length should not be entirely dismissed relative to these species.
- 6.6 From the hatch opening inspection no obvious evidence of bat use was noted; the presence of underfelt increases potential roosting opportunities for crevice dwelling bats such as Pipistrelle bats whereby they often roost between the two materials subject to external access being available .
- 6.7 The mill section and mill pit are divided from the cottage living area by a brick partition wall and are accessed via their own external entrance. Internally the upper



floor is of approximate dimensions 6 metres long by 6 metres wide, is light filled due to the presence of a window and is open to the underside of the ridge; underfelt is absent beneath the roof slates within this area. Feeding remains and a total of ten droppings, indicative of the Brown Long Eared bat, were located on the upper floor; however the majority of these were old with only several of a fresh nature. A further 15 droppings identifiable to that of the Pipistrelle bat were also noted but only several being classified as being recently deposited; up to 50 unidentified droppings were also present which could not be identified due to their deteriorated state. The mill pit was found to be climatically cold, dark and damp, which can suit the hibernation requirements of several bat species. Furthermore numerous internal crevices exist within the brickwork of which many are very deep and as a result could not be conclusively investigated for bat presence/absence. Within the mill pit evidence of bats was found in the form of a single fresh dropping thought to be typical of Daubenton's bat.

- 6.8 During the external assessment it was noted that opportunities for bat ingress are abundant on the exterior of both the cottage and the mill. Gaps are abundant at wall plate level and at external timber features to all elevations. In addition to this there are frequent slipped, missing and raised slates to all roof pitches. At the roof verge of the cottage at both the east and west elevations, gaps exist where mortar is missing. At the east and north facing exterior elevations a significant number of bat droppings were identified to an estimated 2,500 most of which appear to be that of Pipistrelle species although the presence of a mixed roost cannot be discounted.
- 6.9 Number 1 outbuilding could not be conclusively investigated either externally or internally due to its extremely dangerous current condition. It is of red brick construction with a slate pitched roof; the roof and walls are in the process of collapse due to the condition of the building and its continuing deterioration will over time reduce its ability able to meet the roosting requirements of bats. Currently it appears that bat roost potential for singular bats may be present internally.
- 6.10 The remaining two outbuildings were inspected both internally and externally; the smallest of the buildings is of metal construction and to approximate dimensions 3 meters wide by 2 metres long. This building is entirely devoid of bat roost potential and no evidence was found to suggest such use. The third is of corrugated concrete asbestos construction and of approximate dimensions of 3 metres wide by 4 metres long and is similarly to the aforementioned, devoid of bat roost potential with no evidence of use.

Daytime Results - Birds

- 6.11 Although the extending habitat is particularly suitable for barn owls the immediate woodland habitat is not, and throughout the inspection no recent or historic signs of use were observed in relation to breeding/roosting and, most importantly, Mill Cottage is generally unsuitable as are most of the outbuildings. Signs of other nesting birds that rely upon built structures, e.g. House sparrow (*Passer domesticus*), House martin (*Delichon Urbica*), Swift (*Apus apus*) and Swallow (*Hirundo rustica*) was also absent. Notwithstanding an absence of use there are numerous opportunities on all elevations which could be utilised by birds such as House Sparrows etc; the trees and hedges within the grounds are also of a multi beneficial nature for birds with abundant foraging as well as ample nesting opportunities.



7.0 Daytime Conclusions

- 7.1 At Mill cottage and its associated mill pit evidence of bat use has been confirmed by way of more than one species, the number of droppings present at the cottage is indicative of a maternity roost. The collective combination of the cottage, mill section and mill pit contains roost potential for more than one roost purpose including hibernation, notably for the latter within the mill pit itself.
- 7.2 This combined overall favourable assessment relative to bats and the confirmation of a roost means that conversion of or any works to the interior or exterior of the cottage and associated mill will have an impact on bats and their roost/s.
- 7.3 Whilst the loft space of the cottage appears not to be ideally suited to the requirements of loft dwelling bats such as the Brown Long Eared other species, such as the Whiskered/ Brandt's bat will often use low level height roof voids. On occasions the Lesser horseshoe will also use such voids, although had loft dwelling bats been present it would, in all probability, been apparent from the hatch inspection.
- 7.4 The conclusions that have been reached will result in the recommendation of nocturnal emergence surveys and dusk re-entrance surveys on both sections of the building during the main active season of bats i.e. May-August. These recommendations will aim to establish the use of the building by bats and confirm species and numbers involved.
- 7.5 Hibernation potential has been specifically identified in the mill pit; hibernation is a critical element to bats survival. Most hibernating bats rarely leave visible physical evidence of their presence; the work at the site and the conversion could impact on bat species therefore further survey work will be recommended.
- 7.6 There are no current implications in relation to barn owls and no evidence of breeding birds was identified on the site. The proposals would not result in the loss of a site that is used by barn owls for breeding or roosting purposes but may impact on birds that may use the site if the work is undertaken during the breeding season. (March- August)

8.0 Daytime Recommendations & Implications

- 8.1 For the reasons outlined in the survey results, i.e. due to the presence of a confirmed roost/s within the cottage and associated mill section it is recommended that in order to establish how bats are using the buildings and which species are present a minimum of three dusk emergence or/and dawn re-entry surveys will be required prior to any internal or external work being undertaken at either the Cottage or the Mill. The surveys will need to be undertaken during the main active season of bats i.e. between May – August as bats, particularly Pipistrelle often alternate between roosts and do not necessarily use one roost over their active season. A consecutive dusk/dawn survey is classified as one survey. (See Figure 1: Extract from Bat Conservation Bat Surveys: Good Practice Guidelines)



Table 8.5 Minimum number of presence/absence survey visits required to provide confidence in negative preliminary roost assessment results from buildings, built structures and trees in summer

High roost potential	Low to moderate roost potential	Low roost potential
3 dusk emergence and/or pre-dawn re-entry surveys during May to September Optimum period May – August	2 dusk emergence and/or pre-dawn re-entry surveys during May to September Optimum period May – August.	1 dusk emergence and/or pre-dawn re-entry survey during May to September Optimum period May – August.
If bats are discovered emerging from any of the buildings during surveys, the survey schedule should be appropriately adjusted to increase the survey effort so that sufficient information can be collected. Note: two surveys carried out within the same 24 hour period constitute 1 survey		

- 8.2 In relation to the hibernation potential identified in the mill pit it is recommended that hibernation surveys are undertaken. The accepted methodology to complete these surveys would be that three site visits are carried out spaced between December and February as this is the time period during which bats hibernate. The surveys will consist of a licensed bat ecologist with extensive hibernation survey experience and a NRW hibernation licence to attend the site and investigate the identified areas for the presence of bats.
- 8.3 It should be noted that where bat/s or their roost/s hibernacula is/are affected by work, then work would be delayed until such time that a Natural Resources Wales bat mitigation licence is applied for and granted to allow any work to legally commence. Notwithstanding the granting of a licence, works that would affect a roost cannot take place if a maternity colony or hibernating bat/s is/are in occupation.
- A licence is needed if the consultant ecologist, on the basis of survey information and specialist knowledge of the species concerned, considers that on balance the proposed activity is reasonably likely to result in an offence under the Conservation of Habitats & Species Regulations 2010. (as amended) From the evidence gained during the daytime survey and the nature of the proposed work the probability of a licence being required is high.
 - A licence should be applied for if offences are unavoidable and the work should not commence until a licence is obtained.
 - The application should be completed by the developer and a consultant ecologist; the ecologist will need to be able to demonstrate to the satisfaction of Natural Resources Wales that they have the relevant skills and knowledge of the species concerned.
- 8.4 In relation to nesting birds as previously stated no evidence of nesting birds was located however the tree, hedgerow and scrub is of value to many bird species. Any work which will potentially impact active bird's nest/s should not be undertaken during their breeding season May – September unless their absence can be confirmed by a suitably qualified ecologist. All wild birds (with only minor exceptions) and their nests whilst being built or containing eggs or dependant young are protected under the Wildlife & Countryside Act 1981 (as amended).
- 8.5 Mill cottage and its immediate habitat is largely free from artificial lighting; as potential for foraging/commuting bats has been identified any future development should



ensure that light spillage does not impact upon such habitat, similarly it will need to be ensured that any additional lighting does not have an impact upon roost locations.

If inappropriate and ill designed lighting is implemented then there is likely to be an adverse impact upon bats; see extract below from Bat Conservation Lighting Guidelines.

In addition to causing disturbance to bats at the roost, artificial lighting can also affect the feeding behaviour of bats. There are two aspects to this. One is the attraction that light from certain types of lamps has to a range of insects; the other is the presence of lit conditions.

Lighting can be particularly harmful if used along river corridors, near woodland edges and near hedgerows used by bats. In mainland Europe, in areas where there are foraging or 'commuting' bats, stretches of road are left unlit or lighting is designed in such a way as to avoid isolation of bat colonies.

Type of lamp (light source)

The impact on bats can be minimised by the use of low pressure sodium lamps or high pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its UV filtration characteristics.

Luminaire and light spill accessories

Lighting should be directed to where it is needed and light spillage avoided. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only.

Planting can also be used as a barrier or manmade features that are required within the build can be positioned so as to form a barrier.

Lighting column

The height of lighting columns in general should be as short as is possible as light at a low level reduces the ecological impact. However, there are cases where a taller column will enable light to be directed downwards at a more acute angle and thereby reduce horizontal spill. For pedestrian lighting this can take the form of low level lighting that is as directional as possible and below 3 lux at ground level. The acceptable level of lighting may vary dependent upon the surroundings and on the species of bat affected.

Predicting where the light cone and light spill will occur

There are lighting design computer programs that are widely in use which produce an image of the site in question, showing how the area will be affected by light spill when all the factors of the lighting components listed above are taken into consideration. This should be a useful tool to inform the mitigation process.

Light levels

The light should be as low as guidelines permit. If lighting is not needed, don't light.



Timing of lighting

The times during which the lighting is on should be limited to provide some dark periods. Roads or track ways in areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies. These unlit stretches should be 10 m in length either side of commuting route.

11.0 Dusk Survey Results

- 11.1 Relative to the nature and condition of the building it has been classified as offering high bat roost potential; the survey effort was proportionate to that classification and the surveyors were located where identified bat roost potential was visible.
- 11.2 The dusk emergence observations were undertaken on the 5th July and 19th July 2016 and were completed by three highly experienced surveyors; Ms K. Swift, an experienced ecologist and bat surveyor, who holds a Class 2 Natural England Bat Licence (22801-CLS), Ms K. Wilding an experienced ecologist and bat surveyor, who holds a Class 2 Natural England Bat Licence and Mr S.Irwin, proprietor of the Tyrer Partnership with over 30 years experience in bat ecology holding an NRW bat licence (51880: OTH: CSAB: 2014) as well as a long standing holder of a Class 2 Natural England Bat Licence. The dawn survey conducted on the 16th of August was completed by Ms K. Swift, Mrs K.Wilding and Ms A. Mercer an experienced bat ecologist with over three years experience of professional bat surveys with the Tyrer Partnership.
- 11.3 The surveyors were located in positions where unrestricted views of the identified roost potential were achievable. The surveys were aided with Anabat electronic detectors to locate and record the high frequency calls that are emitted by bats. Echolocation calls were then analysed with computer software to verify field observations.

The number of surveys was adequate relative to the roost potential that was identified and the level of survey effort was established by the judgement of the surveyor Ms K Swift.

Times of Survey	Date	Weather Conditions
Dusk survey 2120 - 2250	5 th July 2016	Sunset: 2140: dry, light air, 5 % cloud cover Start temp: 13 °C End temp: 12 °C
Dusk survey 2115 -2345	19 th July 2016	Sunset: 2130: dry, humid, 100% cloud cover Start temp: 29 °C End temp: 29 °C
Dawn Survey 0430-0600	16 th August 2016	Sunrise 0550: dry, light air, 10% cloud cover. Start temp: 17 °C End temp: 16 °C



Survey	Date	Results
Dusk survey	5 th July 2016	Summary –Five Soprano Pipistrelle bats two Common Pipistrelle bats four Brown Long Eared bats and a Brandts bat all emerged from Mill Cottage. 2146 hrs: One Soprano Pipistrelle bat emerged from the south elevation of the building at the roof verge. 2150 hrs: Two Soprano Pipistrelle bats emerged from the south elevation of the building at the eaves of the out rigger. 2152 hrs: One Soprano Pipistrelle bat emerged from the south elevation of the building at the eaves. 2201 hrs: One Common Pipistrelle bat emerged from the west gable of the building 2208 hrs: One Soprano Pipistrelle bat emerged from the south elevation of the building at the eaves. 2217 hrs: A Noctule bat commuted over the site from east to west. 2224 hrs: One Brown Long Eared Bat emerged from the east facing gable of the building 2228 hrs: One Brown Long Eared Bat emerged from the east facing gable of the building 2236 hrs: One Brown Long Eared Bat emerged from the east facing gable of the building followed rapidly by a further two Brown Long Eared bats from the same point. 2238: Bat emerged from east facing elevation of Mill Cottage identified as Brandts. Constant high level foraging/commuting activity took place by Common and Soprano Pipistrelle bats throughout the survey with echolocation calls of BLE immediate frequently recorded.

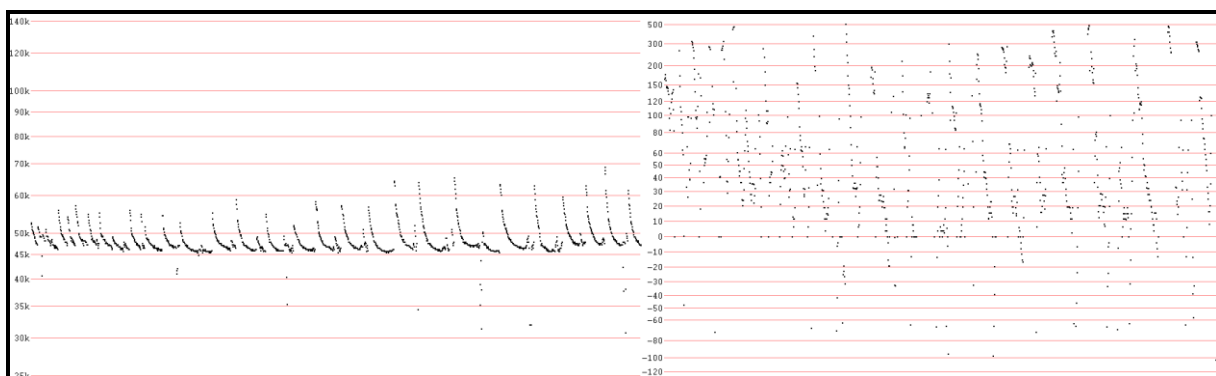


Dusk survey	19 th July 2016	<u>Summary – No emergence recorded from the building with a single bat record throughout.</u> 2146 hrs: Echolocation of the Brown Long Eared bat recorded with no visual Foraging activity around the grounds during the observation period was absent.
Dawn Survey	16 th August 2016	<u>Summary- Five bat species recorded on site with four species/subspecies re-entering the building.</u> <u>A total of 11 Brown Long Eared Bats entered the same point at the apex of the east gable. A single Whiskered Brandts bat entered the building on the</u> 0433 hrs: Common Pipistrelle bat recorded foraging on the site 0440 hrs: Brown Long Eared Bat commutes on to site and proceeds to swarm at the east facing gable 0443 hrs: Soprano Pipistrelle bat commutes on to the site. 0500 hrs: Brown Long Eared Bat enters east facing gable 0509 hrs: Brown Long Eared Bat enters east facing gable 0511 hrs: Brown Long Eared Bat enters east facing gable 0514 hrs: Noctule bat commuted over the site from east to west. 0515 hrs: Brown Long Eared Bat enters east facing gable 0517 hrs: Brown Long Eared Bat enters east facing gable 0517 hrs: Soprano Pipistrelle bat enters south facing gable 0519 hrs: Brown Long Eared Bat enters east facing gable 0520 hrs: Brown Long Eared Bat enters east facing gable 0521 hrs: Brown Long Eared Bat enters east facing gable 0526 hrs: Three Brown Long Eared Bats

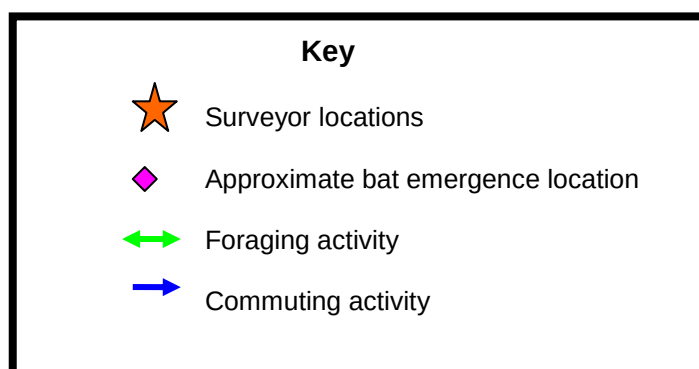
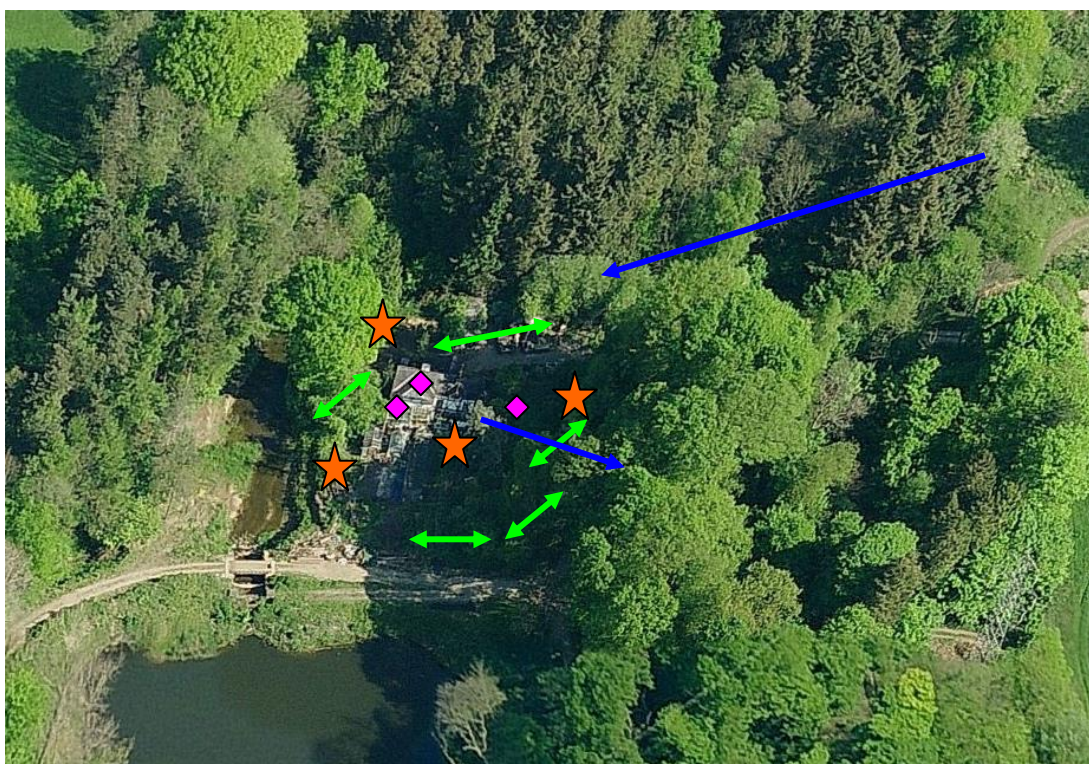
Mill Cottage, Marchwiel Hall, Wrexham, LL13 0SS
Inspection and Assessment in Relation to Bats and Breeding Birds including
Dusk Survey Results



		enter site from tree line and immediately enter east facing gable 0527 hrs: Common Pipistrelle bat commutes on to site and swarms at west facing gable 0528 hrs: Soprano Pipistrelle bat enters south facing gable 0534 hrs: Common Pipistrelle bat commutes on to site and swarms at west facing gable, enters building 0535 hrs: Whiskered/Brandts bat commuted on to site and immediately enters. 0538 hrs: Soprano Pipistrelle bat enters south facing gable 0539 hrs: Common Pipistrelle bat enters site and swarms at west gable with second bat, both enter building rapidly 0542 hrs: Soprano Pipistrelle bat enters south facing gable Activity continuous throughout until 0542 with foraging and swarming recorded by four bat species.
--	--	---



Anabat sonogram and slope analysis of Common Pipistrelle bat emerging from building on 20.7.16



12.0 Dusk Conclusions & Recommendations

- 12.1 From the 2016 dusk survey results it can be concluded that three bat roosts of three different bat species are present at the cottage. Mill Cottage is being used as a maternity roost by Brown Long Eared bats and a day roost by Common Pipistrelle and Whiskered Brandt's bats. The presence and destruction of three bat roosts will need to be addressed from both a conservation and legal perspective along with appropriate mitigation. A European Protected Species Mitigation Licence (EPSML) will be required to legally destroy a place that is used for rest or shelter (roost) by bats; however before a licence can be applied for all planning issues need to be resolved.

In order that the LPA can implement its obligations under the Habitat & Species Regulations 2010 (as amended) then once a scheme is formulated appropriate and proportionate mitigation will need to accompany the planning application which will demonstrate that the "*favourable conservation*" of the species concerned can be maintained.

APPENDIX I – Site Photographs



Mill Cottage and adjoining mill



Interior of low level loft space over Mill cottage



Location of droppings on the north elevation exterior render



Close up of droppings at north elevation



Droppings on the east facing elevation



Adjoining mill and mill pit



Mill pit suitable for hibernation



Gaps present within the mill pit which could be potentially utilised as a hibernacula



Outbuilding 1 with a degree of bat roost potential