"Providing Common-sense Solutions for Sustainable Development"

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Lightwood Farm, Cheadle

Bat and Bird Presence/Absence Survey Report

May 2017



Bat and Bird Presence/Absence Survey

At

Lightwood Farm
Ashbourne Road
Cheadle
Staffordshire
ST10 1SJ

For

Mr. Paul McCormick

(Proprietor)

Executive Summary

0.1 Report rationale

This report has been prepared at the request of Mr. Paul McCormick (proprietor) in relation to the identification and location of protected bat and bird species in the western section of the barn at Lightwood Farm, Ashbourne Road, Cheadle, Staffordshire, ST10 1SJ (OS Grid Reference: SK 02162 42861). In total, one roost scoping and one dusk activity survey were completed on 3rd April 2017, with one further dusk activity survey (3rd May 2017) and one dawn activity survey (15th May 2017) being undertaken.

0.2 Background

Under the current proposals, the remaining 50% of the barn will be redeveloped into residential properties. The other 50% has already been redeveloped into residential dwellings over the past few years. Evolution Ecology Ltd had undertaken bat activity surveys during 2014, with both mitigation and compensation included into the developments due to the presence of bats within the section of the barn.

0.3 Ecological Impact Assessment

Bat presence/absence

The predicted impact on local colonies of these species would appear to be negligible, as the barn that is still to be renovated was found not to contain any bats. However, the barn that has already been re-developed contained three common pipistrelle (*Pipistrellus pipistrellus*) bats.

Roost ecology of species on-site

Based on the evidence obtained during all of the survey efforts, the presence of bats and a degree of academic supposition, it would appear that eastern section of the barn currently houses a common pipistrelle (*Pipistrellus pipistrellus*) bat roost.

Ecological value of building unit(s)

The western section of the barn that is currently proposed for redevelopment is considered to be of low ecological value to both bats and birds. This is due to no bats being identified within this section of the barn during the 2017 surveys, with no active birds' nests present.

0.4 Mitigation Recommendations

Please see section '5 – Recommendations' for a breakdown of the proposed measures which should be incorporated into the planned works at Lightwood Farm, Cheadle.

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1 INTRODUCTION

This report has been prepared at the request of Mr. Paul McCormick (proprietor) in relation to the identification and location of protected bat and bird species in the western section of the barn at Lightwood Farm, Ashbourne Road, Cheadle, Staffordshire, ST10 1SJ (OS Grid Reference: SK 02162 42861). In total, one roost scoping and one dusk activity survey were completed on 3rd April 2017, with one further dusk activity survey (3rd May 2017) and one dawn activity survey (15th May 2017) being undertaken.

1.1 Site description

The site is set in a rural location on Ashbourne Road, Cheadle and it occupies an area of approximately 3000m^2. The barn is a two storey solid brick structure, which again has a pitched clay tile roof. The building units are situated on the outskirts of Cheadle, Staffordshire (the town centre of which is located roughly 1.2km to the northwest) and there are a number of ecological features that would benefit bats and birds, both on and around the site. These include; woodland, scattered farm/barn buildings, mature trees, water bodies (including stream/brooks) and linear features such as hedgerows and stone walls. The site and surrounding habitat is considered to provide all of the necessary features that roosting bats and nesting birds require to thrive.

Figure 1: An aerial map showing the location of the farmhouse/barn at Lightwood Farm, Cheadle (indicated by the red line boundary) in relation to some of the immediately surrounding habitats.



1.2 Proposed works

Under the current proposals, the western section of the barn will be redeveloped into residential properties. The other 50% has already been redeveloped into residential dwellings over the past three years. Evolution Ecology Ltd had undertaken bat activity surveys during 2014, with both mitigation (time avoidance) and compensation (bat boxes and bat access tiles installed), included in the developments due to the presence of bats within the section of the barn.

1.3 Aims of survey

The actions of the surveyors on the site and during the production of the report were conducted in accordance with Bat Conservation Trust (BCT) guidelines (3rd edition). The aim of the survey was to undertake an appraisal of the building/s and surrounding area to establish the following:

1.3.1 Survey protocol considered any protected bat species on-site

Bats

- To establish the probability of bats and their roost sites being present at the proposed re-development site.
- To assess the roost status.
- To assess suitable food resources and habitat requirements.
- If a roost site is found, to provide an impact assessment.

1.3.2 Survey protocol also considered any protected bird species on-site:

Barn Owls

- To establish if barn owls were using the site.
- To locate nest sites, if present.
- To assess what types of activities were shown within the site of interest.
- To assess suitable food resources and habitat requirements.
- To provide an impact assessment, if barn owls are present.

Birds

- To establish if birds were using the site.
- To locate nest sites, if present.
- To assess what types of activities were shown within the site of interest.
- To assess suitable food resources and habitat requirements.
- To provide an impact assessment, if nests are found.

1.3.3 The information was subsequently used in conjunction with the knowledge of the proposed works at the site to determine:

- What impacts the works are likely to have on any protected species found at the site.
- The need for any Natural England development licence application to be made in respect of activities concerning protected species.
- Recommendations for any mitigation measures that would be required.

2 SURVEY METHODOLOGY

2.1 Summary of survey methods

The objective of this report is to provide an ecological evaluation of the site in relation to its suitability for bat and bird utilization. The survey considered the potential for roosting bats and gathered any anecdotal evidence (i.e. bats, bat droppings, feeding remains, urine stains and grease marks) that may support their presence within the building unit(s).

2.1.1 Walkover survey

A walkover survey of the site and a visual inspection of the building/s and any trees were undertaken, to determine the availability of the required resources for the protected species in the immediate area. This would allow us to determine:

- Presence or absence of bats onsite (i.e. roosting).
- Evidence and/or potential of bat roosts onsite (i.e. summer roosts).
- Whether additional surveys are required.

2.1.2 External Inspection of the Building Elevations

The buildings on-site were inspected both externally and internally for signs of bat activity. Notes were made on the following in accordance with the guidelines published by the BCT for the scoping and surveying of building/s and built structures:

The objective of this survey was to locate suitable ingress, and egress points that protected species (bats) could use to fly into the building/s and also to identify any areas within the building/s in which these species may be able to roost and/or nest. The survey method used to inspect the external walls and roof of the buildings was a visual assessment with the use of binoculars, torch, endoscope and ladders in full daylight.

This allowed us to determine the following information:

- Type and age of buildings.
- Type of construction.
- Presence of potential roost features (e.g. missing roof tiles, raised tiles, roof voids).
- Presence of suitable entry and exit points (e.g. broken windows, missing windows and doors/ridges and the apex of the buildings).

- Amount and location of evidence of bats such as the presence of live or dead bats, droppings, grease marks, urine stains and/or characteristic smell of bats.

2.1.3 Internal Inspection of the Building Elevations and Rooms

The object of this survey was to locate and focus on areas which provide appropriate environmental conditions for bats. To do this, we must:

- Look for warm dark areas, joints, crevices, beams and cavities for possible bat roost sites and nest sites.
- Locate roost sites.
- Listen for bats.
- Examine floors, walls and structural elements for droppings, corpses, skeletons and dead insects.

2.1.4 Building Rating

In the absence of any evidence, structures have been assigned a rating of suitability from negligible to high potential for supporting bats. The rating is based on the location of the structure in the surrounding landscape, the number, and type of features suitable for use by bats and the surveyor's experience. For example; a structure with a high level of regular disturbance with few opportunities for access by bats, that is in a highly urbanised area with few or no mature trees, parkland, woodland or wetland would generally equate to having negligible potential. Conversely, a pre 20th-Century or early 20th-Century building with many features suitable for use by bats close to good foraging habitat would have high potential.

2.1.5 Roost Categories

Any structures with evidence of bats will be further evaluated to assess which of the following roost categories may be present onsite (if any):

- **Maternity or Nursery Roost** – used by breeding bats, where pups are born and raised to independence (anecdotal evidence may support this prospect).

- **Hibernation Site** – where bats may be found during the winter (this is assessed within the context of this report).

- **Daytime Summer Roost** – used by males and/or non-breeding females.

- **Night Roost** – where bats rest between feeding bouts during the night but are rarely present during the day.

- **Feeding Roost** – where bats temporarily hang up to eat an item of prey.

- **Transitional (or Swarming) Site** – where bats may be present during the spring or autumn (this cannot be assessed within the context of this report).

2.1.6 Bat Detector Survey (Emergence survey)

If required, the object of this survey is to detect active bats leaving possible roost sites identified in the external and internal surveys. This is achieved by:

- Being at the site 30 minutes before sunset and 90 minutes before sunrise.
- Listening for social calls at potential roost sites.
- Standing at different transect points around the buildings, using the bat detector to hear the bats plus trying to see the first bats emerge.
- Standing at different transect points at foraging areas.
- Carrying out this survey up to two hours after the first bats emerge and 15 minutes after sunrise. This will cover the emergence and returning period to the roost site, for some bat species.

2.1.7 Evidence will be used to determine whether a European Protected Species (EPS) licence will be required to ensure legal compliance during development. This will also include identifying which mitigation measures [if any] would be most appropriate.

2.2 Pre-survey data search

2.2.1 An ecological data search supplied by Staffordshire Ecological Record (SER) was commissioned, in order to establish whether any bat species have been recorded within a 2km radius of the proposed re-development area.

2.2.2 A desktop study of the area using online resources was undertaken independently to corroborate the current overview of the site and its importance in the landscape. Websites used for this study include www.magic.gov.uk, www.naturalengland.org.uk, Google Earth and www.ordinancesurvey.co.uk.

2.3 Surveyors Information

2.3.1 The survey was undertaken by licensed bat ecologist/s and members of the Institute of Ecology & Environmental Management (CIEEM):

Mr. Paul Keeling BSc (Hons) MCIEEM Senior Ecologist, Natural England Bat Survey Licence Number: 2016-26861-CLS-CLS Bat Survey Level 2.

Mr. Richard Millington BSc (Hons), Assistant Ecologist, Natural England Bat Survey Licence Number: 2016-26861-CLS-CLS Bat Survey Level 2.

Mr. Ian Milward, Assistant Ecologist.

2.4 Field surveys

2.4.1 Habitat Surveys

Evolution Ecology Ltd has previously undertaken dusk and dawn bat surveys during the summer of 2014, requested by the client (this report is available upon request). During these surveys, the barn was found to contain a small common pipistrelle (*Pipistrellus pipistrellus*) male roost that were using two separate roosting areas in the roof space/s. The peak count from the survey efforts was of 6 bats. Suitable avoidance measures were applied (undertaking re-roofing works during the 2014 winter months) and compensation features were introduced to the site.

2.4.2 Roost Surveys - weather conditions and timing

The barn was externally and internally inspected for the presence of bats and birds with the use of binoculars, torches, an endoscope and ladders, in full daylight.

Table 1: Scoping Survey and Dusk Activity Survey, Environmental Variables

Environmental variables	Scoping and Dusk Activity Survey of the barn – 3rd April 2017
Temp Start	10°C
Temp Finish	9°C
Humidity Start	65%
Humidity Finish	65%
Cloud Cover Start	80%
Cloud Cover Finish	80%
Wind Speed Average	Low
Precipitation	Dry

Table 2: Dusk Activity Survey, Environmental Variables

Environmental variables	Dusk Activity Survey of the barn – 3rd May 2017
Temp Start	12°C
Temp Finish	12°C
Humidity Start	73%
Humidity Finish	73%
Cloud Cover Start	10%
Cloud Cover Finish	10%
Wind Speed Average	Low
Precipitation	Dry

Table 3: Dawn Activity Survey, Environmental Variables

Environmental variables	Dawn Activity Survey of the barn – 15th May 2017
Temp Start	11°C
Temp Finish	12°C
Humidity Start	74%
Humidity Finish	74%
Cloud Cover Start	10%
Cloud Cover Finish	10%
Wind Speed Average	Low
Precipitation	Dry

2.4.3 Roost and Activity Surveys

The roost/scoping and dusk activity surveys were completed on the 3rd April 2017, with one further dusk and one further dawn activity surveys being conducted on the 3rd May 2017 and 15th May 2017 respectively (please see tables 1, 2 and 3 for the environmental variables from these surveys). The type of equipment used during the dusk surveys were the Batbox Duet, SSF Bat2 heterodyne and frequency division bat detectors along with EcoObs batcorder.

Batcorder

The EcoObs batcorder is the first worldwide data recorder that distinguishes bat calls from other sound sources in real-time (online signal analysis). Calls are recorded digitally as call sequences. The batcorder is used alongside Batbox Duet and SSF Bat2 heterodyne and Frequency Division bat detectors and provides an unbiased statistical analysis of bat species recorded during a survey on site.

Recorded bat sound is subsequently analyzed using bcAdmin, batIdent and bcAnalyze software which calculates a confidence interval of accuracy (CI = %) and is used in conjunction with visual and audible data recorded during survey, to ascertain a holistic view of bat species present.

3 RESULTS

3.1 Pre-survey data search

Staffordshire Ecological Record (SER) was commissioned to carry out an ecological data search of all protected bat and bird species within a 2km radius of 'Lightwood Farm,' Cheadle. The searches uncovered records of numerous protected species within the vicinity of the site.

Table 2 shows all UK BAP and non-BAP bat species, some of which have been recorded within a 2km search radius of 'Lightwood Farm,' Cheadle. Those highlighted in bold were identified within the 2km search radius.

Table 2: The bats identified on the 2km ecological data search provided by SER.

UK BAP	Common name	Latin binomial	County records within 2km
☑	Barbastelle	*Barbastella barbastellus*	☒
☑	Bechstein's	*Myotis bechsteinii*	☒
☑	**Brown Long-eared**	***Plecotus auritus***	☑
☑	**Noctule**	***Nyctalus noctula***	☑
☑	Greater Horseshoe	*Rhinolophus ferrumeguinum*	☒
☑	Lesser Horseshoe	*Rhinolophus hipposideros*	☒
☑	**Soprano pipistrelle**	***Pipistrellus pygmaeus***	☑
☒	Alcathoe	*Myotis alcathoe*	☒
☒	**Brandt's/Whiskered**	***Myotis brandtii/mystacinus***	☑
☒	**Common pipistrelle**	***Pipistrellus pipistrellus***	☑
☒	**Daubenton's**	***Myotis daubentonii***	☑
☒	Grey Long-eared	*Plecotus austriacus*	☒
☒	Leisler's	*Nyctalus leisleri*	☒
☒	Nathusius' pipistrelle	*Pipistrellus nathusii*	☒
☒	Natterer's	*Myotis nattereri*	☒
☒	Serotine	*Eptesicus serotinus*	☒

With regards to birds, a number of protected species have been identified within the 2km search radius. All UK birds can be split into three categories of conservation importance (red, amber and green – please see RSPB for more information). Table 3 shows the red and amber-listed species identified within 2km of the proposed re-development site.

Table 3: All amber and red-listed bird species identified on the 2km ecological data search provided by SER.

Common Name	Latin binomial	Conservation Importance
Arctic Tern	*Sterna paradisaea*	Amber
Avocet	*Recurvirostra avosetta*	Amber
Barnacle goose	*Branta leucopsis*	Amber
Bar-tailed godwit	*Limosa lapponica*	Amber
Black-headed gull	*Chroicocephalus ridibundus*	Amber
Brent goose	*Branta bernicla*	Amber
Bullfinch	*Pyrrhula pyrrhula*	Amber
Common greenshank	*Tringa nebularia*	Amber
Common gull	*Larus canus*	Amber
Common kingfisher	*Alcedo atthis*	Amber
Common sandpiper	*Actitis hypoleucos*	Amber
Common tern	*Sterna hirundo*	Amber
Dunlin	*Calidris alpina*	Amber
Dunnock	*Prunella modularis*	Amber
Garganey	*Anas querquedula*	Amber
Gadwall	*Anas strepera*	Amber
Greater black-backed gull	*Larus marinus*	Amber
Green sandpiper	*Tringa ochropus*	Amber
Greylag goose	*Anser anser*	Amber
House martin	*Delichon urbica*	Amber
Kestrel	*Falco tinnunculus*	Amber
Lesser black-backed gull	*Larus fuscus*	Amber
Mallard	*Anas platyrhnchos*	Amber
Marsh Harrier	*Circus aeruginosus*	Amber
Meadow pipit	*Anthus pratensis*	Amber
Mediterranean gull	*Larus melanocephalus*	Amber
Nightjar	*Caprimulgus europaeus*	Amber
Northern pintail	*Anas acuta*	Amber
Osprey	*Pandion haliaetus*	Amber
Oystercatcher	*Haematopus ostralegus*	Amber
Pink-footed Goose	*Anser brachyrhynchus*	Amber
Redshank	*Tringa tetanus*	Amber
Redstart	*Phoenicurus phoenicurus*	Amber
Reed bunting	*Emberiza schoeniclus*	Amber
Short-eared owl	*Asio flammeus*	Amber
Shoveler	*Anas clypeata*	Amber
Snipe	*Gallinago gallinago*	Amber
Stock dove	*Columba oenas*	Amber
Swift	*Apus apus*	Amber
Teal	*Anas crecca*	Amber
Whooper swan	*Cygnus Cygnus*	Amber
Willow warbler	*Phylloscopus trochilus*	Amber

Wood sandpiper	*Tringa glareola*	**Amber**
Yellow-legged gull	*Larus michahellis*	**Amber**
Black-tailed godwit	*Limosa limosa*	**Red**
Cuckoo	*Cuculus canorus*	**Red**
Curlew	*Numenius arquata*	**Red**
Fieldfare	*Turdus pilaris*	**Red**
Grey wagtail	*Motacilla cinerea*	**Red**
Herring gull	*Larus argentatus*	**Red**
House sparrow	*Passer domesticus*	**Red**
Kittiwake	*Rissa tridactyla*	**Red**
Lapwing	*Vanellus vanellus*	**Red**
Lesser Redpoll	*Carduelis cabaret*	**Red**
Lesser spotted woodpecker	*Dendrocopos minor*	**Red**
Linnet	*Carduelis cannabina*	**Red**
Marsh tit	*Poecile palustris*	**Red**
Merlin	*Falco columbarius*	**Red**
Mistle thrush	*Turdus viscivorus*	**Red**
Pied flycatcher	*Ficedula hypoleuca*	**Red**
Pochard	*Aythya ferina*	**Red**
Redwing	*Turdus iliacus*	**Red**
Ringed plover	*Charadrius hiaticula*	**Red**
Ring ouzel	*Turdus torquatus*	**Red**
Skylark	*Alauda arvensis*	**Red**
Song thrush	*Turdus philomelos*	**Red**
Spotted flycatcher	*Muscicapa striata*	**Red**
Starling	*Sturnus vulgaris*	**Red**
Tree pipit	*Anthus trivialis*	**Red**
Whimbrel	*Numenius phaeopus*	**Red**
Whinchat	*Saxicola rubetra*	**Red**
White-fronted Goose	*Anser albifrons*	**Red**
Willow tit	*Poecile montanus*	**Red**
Woodcock	*Scolopax rusticola*	**Red**
Wood warbler	*Phylloscopus sibilatrix*	**Red**
Yellowhammer	*Emberiza citrinella*	**Red**
Yellow wagtail	*Motacilla flava*	**Red**

Additionally, the ecological data set revealed 14 records of barn owl (*Tyto alba*). The nearest of these were of field observations of 1 specimen at Hales Hall Pool in 2007 and 2010, located approximately 908m to the north-west of the site itself.

A map showing the locations of the records obtained through the ecological data search can be found in Appendix B.

3.1.1 **Designated sites**

Statutory Nature Conservation Designations

Due to the nature of the site and the proposed re-development, it was not necessary to gather information regarding statutory Nature Conservation Designations, as the proposed works will not alter any of the wider surrounding landscape.

Non-statutory Nature Conservation Designations

Due to the nature of the site and the proposed re-development, it was not necessary to gather information regarding non-statutory Nature Conservation Designations, as the proposed works will not alter any of the wider surrounding landscape.

3.2 Field surveys

3.2.1 Habitat description

The barn of interest is a large, two-storey, pre-20th-century U-shaped agricultural building which is of solid brick construction with a pitched clay tile roof. The building/s are situated in a rural location, with the nearest settlement being Cheadle, Staffordshire (the town centre of which is located roughly 1.2km to the northwest).

Due to its rural location, the site is immediately surrounded by agricultural grasslands (on all sides), woodlands, hedgerows and running water courses (in the form of streams/brooks), all of which provide ample utilizable habitat for both bats and birds.

3.2.2 Bat roost and bird nest (including barn owl) survey

Table 5: A description of the barn features and the potential for housing roosting bats and nesting birds.

Table 5.				
Unit / Value	General description + Potential roost/nests features		Evidence of bats/birds (inc barn owls)	Potential for bats/birds
B1	**External:** The barn was determined to be a pre-20th-century U-shaped structure, which is of solid brick construction with a pitched clay tile roof (constructed over two storeys). The eastern half of the barn had already been re-developed over the preceding years (2014-2017) and had new windows and doors. Also present was the compensation features (bat access tiles and bat tubes) that Evolution Ecology Ltd. recommended in 2014. Within the remaining part of the barn (western section), the majority of the doors [and hay-door windows] were found to be of wooden construction, which is thought to be typical for a building of this age. As a result of their construction, a number of the hay-door/windows have degraded somewhat, which has inadvertently created a number of potential access points into the building for protected species. In addition to these areas, further potential access points were apparent on both the ground and first floor levels, in the form of open/broken windows and open doors around the entirety of the building. Numerous vents within the brickwork of the buildings elevations were deemed large enough to allow protected species access (particularly bats)	**Internal:** The internal inspection revealed that barn roof is of square sawn timber construction, with roofing felt being apparent. No bat droppings were identified within any section of the barn. However, this could be due to the anthropogenic presence in the barn meaning a lot of droppings have been swept up or cleared accidentally. No birds' nests were identified within the internal sections of the barn. Sheeting had been applied to the western section of the barn, to ensure that birds (previously identified within the 2014 survey) had not returned to nest. Overall, from the evidence gathered, it is considered that the barn at Lightwood Farm is of high value to roosting bats, with an active maternity roost identified within 2014. This in combination with the suitability of the surrounding habitat means that a minimum of two dusk/dawn activity surveys will be required, in order to identify if the remainder of the building is being utilized by bats for roosting purposes, and if so, to identify the ingress-egress points that are currently being used.	**Bats Yes** ☑	**Bats High**

	into the building. With regards to the roof, the tiles appeared to be in a good overall condition, with very few slipped, missing or raised tiles being apparent. Overall, from the external survey, it has been established that the barn of interest provides ample potential access and roosting/nesting opportunities for both bats and birds.		**Birds No** ☒	**Birds Low**

Table 6: Features of buildings and built structure classification, which may indicate the potential for bats. The full guidance can be found in the Bat Conservation Trust Good Practice Survey Guidelines.

Likelihood of bats being present	Feature of the building or built structure and its location
Higher	Pre-20th century or early 20th century construction[2]. Agricultural buildings of traditional brick, stone or timber construction. Large and complicated roof void with unobstructed flying spaces. Large (>20 cm) roof timbers with mortice joints, cracks and holes. Entrances for bats to fly through. Poorly maintained fabric providing ready access points for bats into roofs, walls, bridges, but at the same time not too draughty and cool. Roof warmed by the sun, in particular south facing roofs. Weatherboarding and/or hanging tiles with gaps. Low level of disturbance by humans. Bridge structures, follies, aqueducts and viaducts over water and/or wet ground. For rarer species, buildings or built structures in the core area of their distribution. Buildings and built structures in proximity to each other providing a variety of roosting opportunities throughout the year. Buildings or built structures close to good foraging habitat, in particular mature trees, parkland, woodland or wetland, especially in a rural setting
Lower	Modern, well-maintained buildings[1] or built structures that provide few opportunities for access by bats. Small, cluttered roof space. Buildings and built structures comprised primarily of prefabricated steel and sheet materials. Cool, shaded, light or draughty roof voids. Roof voids with a dense cover of cobwebs and no sections of clean ridge board. High level of regular disturbance. Highly urbanised location with few or no mature trees, parkland, woodland or wetland. High levels of external lighting.

Table 7: Low/Moderate/High potential building(s) survey recommendations. The full guidance can be found in the Bat Conservation Trust Good Practice Survey Guidelines. These guidelines are what all local authorities abide by.

Bat Conservation Trust

Table 7.3 Recommended minimum number of survey visits for presence/absence surveys to give confidence in a negative result for structures (also recommended for trees but unlikely to give confidence in a negative result).

Low roost suitability	Moderate roost suitability	High roost suitability
One survey visit. One dusk emergence or dawn re-entry survey[a] (structures). No further surveys required (trees).	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey.[b]	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn.[b]

[a] Structures that have been categorised as low potential can be problematic and the number of surveys required should be judged on a case-by-case basis (see Section 5.2.9). If there is a possibility that quiet calling, late-emerging species are present then a dawn survey may be more appropriate, providing weather conditions are suitable. In some cases, more than one survey may be needed, particularly where there are several buildings in this category.

[b] Multiple survey visits should be spread out to sample as much of the recommended survey period (see Table 7.1) as possible; it is recommended that surveys are spaced at least two weeks apart, preferably more. A dawn survey immediately after a dusk one is considered only one visit.

3.2.3 Activity surveys

The dusk and dawn activity surveys were carried out on the 3rd April and the 3rd and 15th May 2017.

After an initial inspection on the 3rd April 2017, a dusk activity survey was undertaken to establish whether any of the bats had returned to their roost. During this survey, one common pipistrelle (*Pipistrellus pipistrellus*) bat was found to be roosting within the buildings, with the access point missed. The bat flew from the yard and in an easterly direction. It was deemed that further survey effort was required during the optimal survey season of May- September to establish the bat presence, the roost locations and the numbers of bats present.

The first dusk activity survey undertaken during the optimal survey season was undertaken on the 3rd May 2017. During this survey effort, one common pipistrelle (*Pipistrellus pipistrellus*) bat was witnessed foraging to the east of the barn. This bat was then witnessed flying in front of the barn (to the south) before commuting off-site to the west.

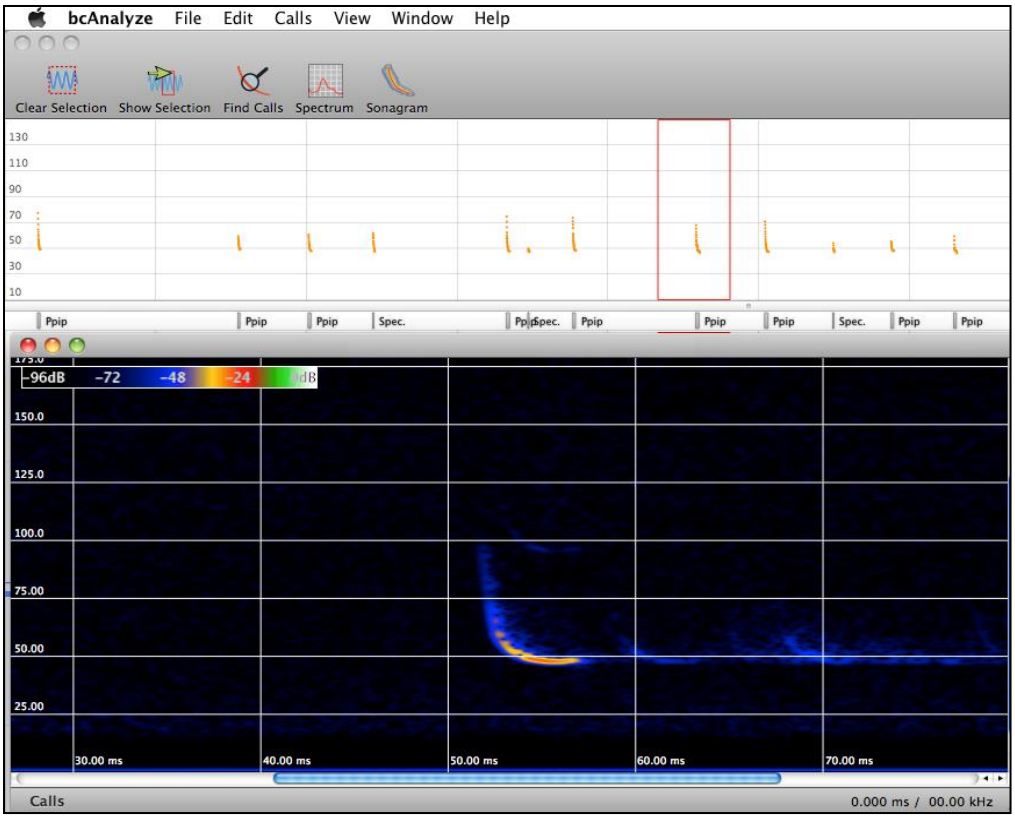
The dawn activity survey was undertaken on the 15th May 2017. During this survey, three common pipistrelle (*Pipistrellus pipistrellus*) bats were identified swarming and returning to the north-eastern corner of the barn. It is highly likely that the specimens identified were using the bat access tile that had been installed on the roof where the original roost was located.

Figure 2: The locations of the bat detectors/surveyors (as indicated by the yellow circles) during the dusk/dawn activity surveys.

The bat detectors/surveyors were strategically scattered around the barn, in order to ensure that the majority of the building's elevations were visually covered. In conjunction with this, the internal portion of the barn building was inspected every 15 minutes, in order to look out for any pre-emergent flight (which is a known characteristic of brown long-eared bats *Plecotus auritus*).



Figure 7: A sonogram of a common pipistrelle (*Pipistrellus pipistrellus*) which was detected during one of the dusk surveys, with a 100% CL (confidence interval of accuracy).



4 IMPACT ASSESSMENT

4.1 Constraints on survey information

The first roost/scoping and dusk activity survey was undertaken outside of the optimal survey period for assessing bat activity in April 2017. With this being the case, it could not be fully ascertained whether the true numbers of bats were resident within the barn. This was negated through undertaken two further dusk/dawn activity surveys during the optimal survey season (May 2017). No further constraints were apparent during the survey efforts, and Evolution Ecology feels confident that this survey report produces an accurate representation of the buildings potential onsite for bats.

4.2 Constraints on equipment used

No constraints were present with regards to the equipment used during the survey (i.e. endoscope, ladders and high powered binoculars).

4.3 Potential impacts of the re-development

Based upon the current planning proposal, whereby:

- The remaining 50% of the barn will be redeveloped into residential properties. The other 50% has already been redeveloped into residential dwellings over the past few years. Evolution Ecology Ltd had undertaken bat activity surveys during 2014 (requested by the client), with both mitigation and compensation included into the developments, due to the presence of bats within the section of the barn.

- The potential impacts have been identified as follows:

4.3.1 *Designated sites*

The presence of any designated sites nearby is not applicable to the proposed project, as the demolition and re-development works are to be conducted within the development site boundary. This, therefore, means that any building works would be of no detriment to the surrounding landscape.

4.3.2 *Roosts*

Short-term impacts: Disturbance [Negligible]

The section of the barn that is due to be re-development is considered to be of low ecological value to roosting bats (due to the identification of bats roosting within the part of the barn that has already been renovated). Therefore, the short-term impact of disturbance to bats is deemed as being negligible, with appropriate mitigation and compensation measures already included into the section that the bats were previously using in 2014.

Long-term impacts: Roost modification [Negligible]

Same as 'Short-term impacts: Disturbance.'

Long-term impacts: Roost loss [Negligible]

Same as 'Short-term impacts: Disturbance.'

4.3.3 Foraging and commuting habitat

The surrounding landscape is considered to provide ideal foraging and commuting habitat for local bats. It is considered that the renovation of the barn would have a negligible negative impact on potential foraging and commuting habitat, as the buildings only are to be affected. The buildings are surrounded by agricultural grasslands, hedgerows, woodlands and brooks/streams, which all provide potential foraging opportunities for insects (which the bats subsequently prey upon). This was evident throughout the dusk and dawn surveys, as the common pipistrelles (*Pipistrellus pipistrellus*) and brown long-eared bats (*Plecotus auritus*) were seen foraging around the perimeter of the buildings.

4.4 Legislation and Policy Guidance

Biodiversity 2020: sets out to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people. The government's policy is aimed at individuals, communities, local authorities, charities, business and government, which all have a role to play in delivering Biodiversity 2020.

National Planning Policy Framework, Section 11: The recently published framework in 2012, replaces the previous Planning Policy Statement 9. Section 11: Conserving and enhancing the natural environment, reaffirms the government's commitment to maintaining green belt protections and preventing urban sprawl, retains the protection of designated sites and preserves wildlife, aims to improve the quality of the natural environment and halt declines in species and habitats, protects and enhances biodiversity and promotes wildlife corridors.

Article 10 of the EC Habitats Directive: The published article requires government to develop features such as 'stepping stones' on the landscape, such as clusters of ponds, tracts of rough grassland or scrubland and vegetated railway line embankments.

Wildlife and Countryside Act 1981: All species of bat are fully protected under the Wildlife and Countryside Act 1981, the European Conservation (Natural Habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000. This legislation makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.

Most resident nesting birds are protected under the Wildlife and Countryside Act 1981, which protects birds, nests, eggs and nestlings. Some rarer species, such as barn owls are afforded extra protection.

5 RECOMMENDATIONS

From the survey efforts during April and May 2017, no bats were identified using the barn that is still to be renovated. However, three common pipistrelle (*Pipistrellus pipistrellus*) bats were identified using the same north-eastern corner, potentially taking advantage of the bat access tiles that have been installed. The numbers have dropped from 6 specimens to 3. This could be due to a number of factors including the disturbance of the renovation (re-roofing works carried out in winter 2014) , natural causes, potential predation or utilising other roosts within their territory. There isn't enough survey data to be able to clarify which of these factors indicate the drop in the population at the site. However, the 2017 survey results confirm that the resident bats are still using the barn.

With regards to birds, no active nests were identified within any of the barn. There is due to be a new open-plan garage developed adjacent to the barn, to the south. This means that no bird mitigation is required as the timber beams will be exposed and provide all of the nesting features that the specimens were utilising in 2014.

6. SUMMARY

6.1 Bat presence/absence

The predicted impact on local colonies of these species would appear to be negligible, as the barn that is still to be renovated was found to not contain any bats. However, the barn that has already been re-developed contained three common pipistrelle (*Pipistrellus pipistrellus*) bats.

6.2 Roost ecology of species on-site

Based on the evidence obtained during all of the survey efforts, the presence of bats and a degree of academic supposition, it would appear that the eastern section of the barn currently houses a common pipistrelle (*Pipistrellus pipistrellus*) bat roost.

6.3 Ecological value of building unit(s)

The western section of the barn that is currently proposed for redevelopment is considered to be of low ecological value to both bats and birds. This is due to no bats being identified within this section of the barn during the 2017 surveys, and with no active birds' nests present.

6.4 Recommendations

Please see section '5 – Recommendations' for a breakdown of the proposed measures which should be incorporated into the planned works at Lightwood Farm, Cheadle.

7 REFERENCES

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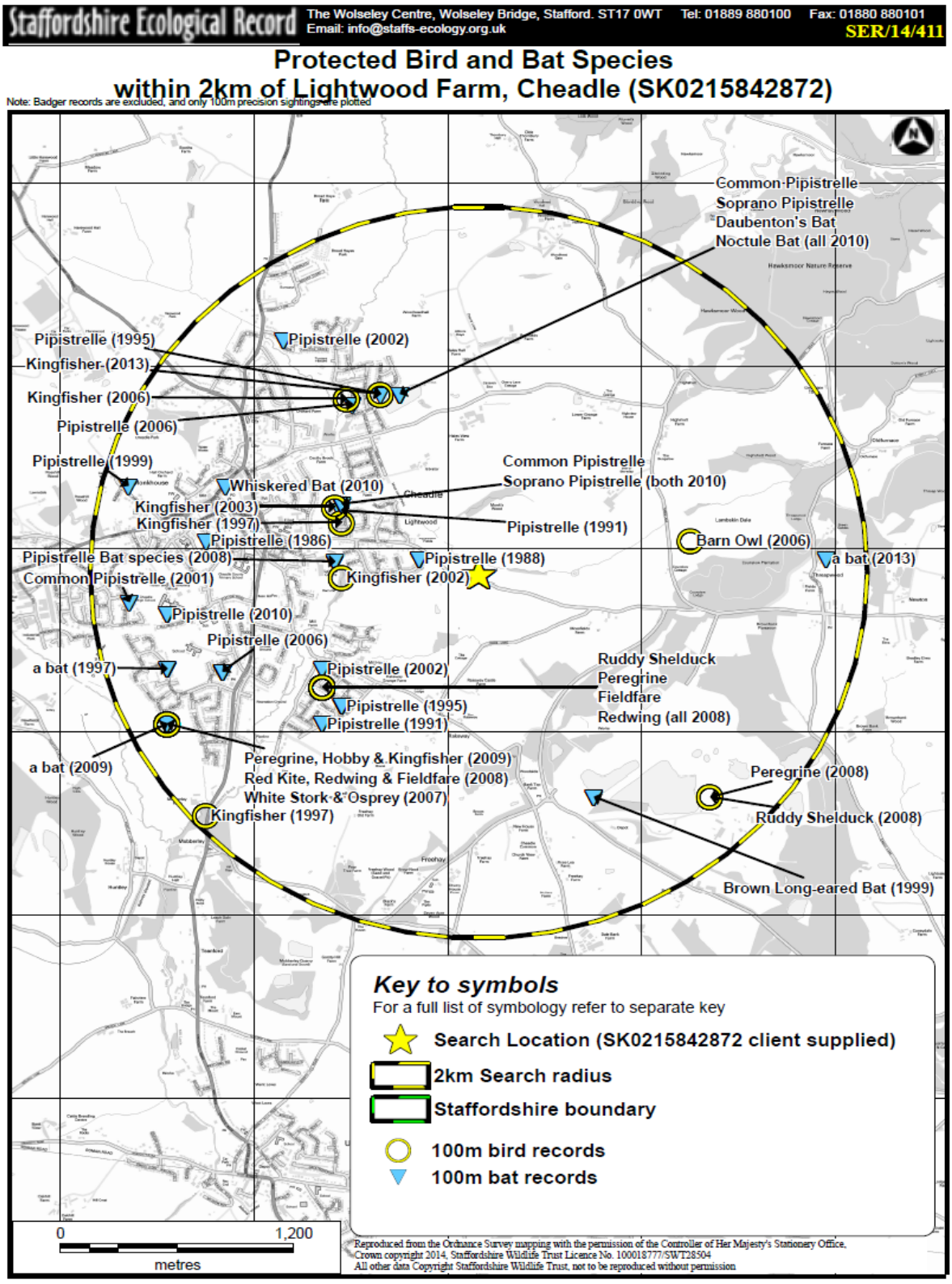
8 APPENDICES

Appendix A: Eco Data Map

Appendix B: Bats and Artificial Light

Appendix C: Additional Photographic Records

Appendix A: The eco data map, provided by Staffordshire Ecological Record (SER). The approximate location of 'Lightwood Farm', Cheadle is indicated by the yellow star.



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A legend to the map showing Nature Conservation Sites and Species

Introduction

These colours are used on the site alert mapping within the SWT GIS, but SER cannot guarantee the same colours are used in any other mapping system, particularly those based on ArcView.

Statutory Designations from Natural England's web-site

- National Nature Reserves
- Sites of Special Scientific Interest
- Local Nature Reserves
- NNR (boundary not available owing to OS restrictions)
- SSSI (boundary not available owing to OS restrictions)
- LNR (boundary not available owing to OS restrictions)

Non-statutory Designations from the Staffordshire Grading System (1995 onwards)

- Site of Biological Importance (ex Grade 1 SBI) equivalent to "Local Wildlife Site"
- Biodiversity Alert Site (ex Grade 2 SBI)
- Proposed/potential Site of Biological Importance

Geological Sites

- Regionally Important Geological/geomorphological Site (= Local Geological Site)

Staffordshire Wildlife Trust Sites

- SWT Nature Reserves

Other Nature Reserves

- Royal Society for the Protection of Birds

Ancient Woodland Inventory

- Ancient & Semi-natural Woodland
- Ancient Replanted Woodland

Species Information

- Mammals excluding those listed below
- Otter (Lutra lutra)
- Badger (Meles meles) - not normally supplied
- Water Vole (Arvicola terrestris)
- All bat species
- All bird species
- Any other protected species (precise to 100m)
- All Protected Species Records (precise to 1km)
- Amphibians and reptiles excluding those below
- Great Crested Newt (Triturus cristatus)
- Native Crayfish (Austropotamobius pallipes)
- Flowering plants except those below
- Bluebell (Hyacinthoides non-scripta)
- Butterflies and Moths
- BAP Species Records (precise to 100m)
- BAP Species Records (precise to 1km)

Notes:

The Local Nature Reserve and other nature reserve boundaries can overlay the current grading when both layers are actively visible

Where there are multiple species records for the same grid reference the dot for one species may obscure the dots for other species - all species records will be displayed in the accompanying spreadsheet

Not all the above categories may be present on the accompanying map

Version 2.0 July 2011

M:\Workspc\SER\EnquiryLegend.wor

Appendix B: Bat and Artificial Lights

Artificial lighting is known to affect bat roosting and foraging behaviour with lighting shown to result in a range of impacts including roost desertion (BCT, 2009), delayed emergence of roosting bats (Downs et al., 2003), increased activity of some bat species and decreased activity by others (Stone et al., 2012).

An experimental approach using LED units, demonstrated that relatively fast-flying bat species, including common pipistrelle, showed no significant impacts as a result of new artificial lighting, even when lighting was set at relatively high levels close to 50 lux. In contrast slow flying bats, including myotid bats (Myotis spp.) showed sharp reductions in presence, even at low light levels of 3.6 lux (Stone et al., 2012). Current recommendations for all bat species specifies that no bat roost should be directly illuminated (BCT 2014).

Mitigation and lighting design Bat friendly lighting plans should firstly look to avoid lighting where possible and minimise lighting impacts by adopting the following measures:

- Lighting curfews or use of PIR sensors. Lighting curfews can be an effective way of avoiding impacts on bats. These curfews may involve either turning off lighting or dimming light units at specific times of the night, dimming units at key times of the year, providing the luminaire allows for this option via a control unit. Lighting to be triggered by PIR sensors can be expected to be illuminated only when required and for a low proportion of the overall time.
- Consider no lighting solutions where possible. Options such as white lining, good signage and LED cats eyes, should be considered as preferable, especially within Zones 1 and 2. Reflective fittings may help make use of headlights to provide any necessary illumination in some areas.
- Use only high pressure sodium or warm white LED lamps where possible. High pressure sodium and warm white LED lamps emit lower proportions of insect attracting UV light than mercury, metal halide lamps and white LED lighting. Generally, lamps should have a lower proportion of white or blue wavelengths, with a colour temperature <4200 kelvin recommended (BCT, 2014).
- Minimise the spread of light. The light spread should be kept at or near horizontal to ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Baffles, hoods, louvres and shields should be used where necessary to reduce light spill.
- Consider the height of lighting column. While downward facing bollard lighting is often preferable, it should be noted that a lower mounting height does not automatically reduce impacts to bats as bollard lighting can often be designed to provide uplighting. Where bollard lighting is considered to be the most appropriate system, bollard spacing or unit density should be kept to a minimum and units should be fitted with the appropriate hoods/deflectors to reduce uplighting Column height should be carefully considered to balance task and mitigation measures.
- Avoid reflective surfaces below lights. The polarisation of light by shiny surfaces attracts insects increasing bat activity (BCT, 2012). Consequently, surface materials around lighting require consideration.

Appendix C: Additional photographic records

Plate 1: A view of the corner of the site where three common pipistrelle (*Pipistrellus pipistrellus*) bats were found to be roosting within the 2017 dawn activity survey.



Plate 2: A photograph that is illustrating the bat tube used on the eastern southern gable end of the barn.



Plate 3: A photograph showing the remainder of the barn that is due to be re-developed under the current proposals. The bat tube is highlighted inside the red circle.



Plate 4: A view of the northern elevation of the barn, showing the numerous vents within the brickwork which lead directly to the interior portion of the building (picture taken in 2014).



Plate 5: A photograph illustrating additional vents along the northern elevation.



Plate 6: This photograph illustates one of the broken boards which could be used as an access point into the building.



Plate 7: The eastern elevation of the barn and its associated northern gable end. This image shows many more vents which are potential access points into the building for bats and birds (picture taken in 2014).



Plate 8: The photographs following from this point were taken during the dawn activity survey. A view of the barn building from the courtyard (picture taken in 2014).



Plate 9: A view of one of the southern gable ends of the barn. One common pipistrelle (*Pipistrellus pipistrellus*) bat was seen to re-enter the building via a small gap in the brickwork towards the apex (as outlined in red) during the 2014 dawn activity survey (picture taken in 2014).



Plate 10: One of the southern gable ends of the barn building. The western extension can be seen to the left (picture taken in 2014).



Plate 11: A view of the site from a south-western viewpoint. The barn building is to the left.



Plate 12: Another overview of the site, as taken from Ashbourne Road.



The Bat-Year

The Bat-Year



January Hibernating; using up fat reserves.



February Still hibernating; few fat reserves left.



March Some activity; occasional bat seen feeding.



April Awake and feeding at night.



May Females looking for nursery sites.



June Young born, usually only one.



July Young still suckling.



August Young start catching insects; females leave nursery to find males.



September Mating season begins; start building fat reserves for hibernation.



October Search for suitable hibernation site.



November Hibernation begins although still some activity in warm weather.



December Hibernating.

9 LIMITING CONDITIONS/DISCLAIMERS (Unless stated otherwise)

9.1 The Service

9.2 Evolution Ecology agrees to supply ecological consulting services of a preliminary nature or a more thorough service as advised or as commissioned.

10 Fees

10.1 The client(s) will settle the agreed fee in full, within 30 days of receiving the invoice. Reports will remain the property of Evolution Ecology until full payment has been received. No liability is accepted for the contents of a report that is not paid in full. Any queries should be notified to Evolution Ecology within 7 days of the invoice date.

10.2 If the client(s) fails to pay within the time specified in 2.1 then Evolution Ecology shall charge the client(s) interest on the outstanding fee, both before and after any judgment, at the rate of 4% per annum above the HSBC Bank base rate, until payment is made in full (A part of a month being treated as a full month for the purposes of calculating interest).

10.3 In the event that it is necessary to recover any outstanding fees from the client(s), the client(s) will fully reimburse any costs and expenses incurred during the recovery period, including court costs. Evolution Ecology reserves the right to make a charge for every letter sent and telephone/fax call made, in connection with the recovery.

11 The Report

11.1 If any part of the report is lost, or altered without the written consent of Evolution Ecology, then the entire report becomes invalid.

11.2 The general format of reports is a certified product and cannot be shown, copied or distributed to third parties without the permission of Evolution Ecology. No liability is accepted for the contents of the report, other than to that of the client(s).

11.3 The report will purport not to express any opinion or comment as to the condition or structural integrity of any building and no reliance should be made on any such comments.

12.1 **Insurance Cover**

12.2 All work carried out by Evolution Ecology is covered by a £1,000,000 professional indemnity insurance.

13.1 **Quality of Craftsmanship**

13.2 When appointing an Ecologist, please use only suitably qualified and experienced companies (The Local Authority and the Institute of Ecology and Environmental Managers may be able to provide a select list of such companies)

13.3 Evolution Ecology will not accept liability for any works undertaken by any other companies, or contractors.