Charnia Ecology
Protected species and habitat surveys

STAGE 2:

Bat and Bird activity survey Report

at

Ivy Cottage,

High Lane, Brown Edge. ST6 8RU.

July 2015

NOTES

Notice to readers

This report has been prepared by Charnia Ecology with all reasonable skill, care and diligence, within the terms of the contract with the client. The actions of the surveyor on site and during the production of the report were undertaken in accordance with the Code of Professional Conduct for the Chartered Institute of Ecology and Environmental Management (www.ieem.org.uk).

Client :	Mr. Richard Clowes. 18 Springfield Road, Gatley, Cheadle. Cheshire. SK8 4PE
Architect:	Ken Wainman Associates Ltd.29A St Edward Street Leek. ST13 5DN
Postcode/ OS Grid Ref:	ST6 8RU / GR: SJ905527
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Non-technical summary

Report rationale

1. This report has been prepared at the request of the client, Mr. Richard Clowes, in relation to the identification of protected bat and bird species at Ivy Cottage, High Lane, Brown Edge ST6 8RU.All activity surveys were carried during optimal periods and conditions under the supervision of a Natural England licensed bat ecologist and member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Proposed works

2. It is understood that the existing brick-built, detached dwelling of "Ivy Cottage" house and associated out-building are to be demolished. The building is currently unoccupied.

Site description

3. "Ivy Cottage" is located in a greenbelt area of the Staffordshire Moorlands, on the fringe of the Potteries Urban area. The property backs onto an open area of semi-improved grassland to the rear, whilst being abutted by neighbouring residential houses to the north and south. Subsequently the area is considered as providing relatively good habitat and resources for both bats and birds, although the adjacent and busy public highway B5109 is considered as a potential dispersal barrier between east to west.

4. All buildings were found to have a number of external features suitable for crevice-dwelling bat species (raised/,missing tiles, cavities in brick-work and gaps above doors). Two internal roof void areas were inspected in the main building, and were were found to be well-sealed, with only minimal light ingress recorded around pinning points on gable-end sections. The presence of modern breathable roofing membrane (BRM), fitted to the underside of the roof would indicate it has been renewed in the last ten years. Both areas were found to be warm, desiccated and dusty.

5. **NO** evidence of bats or birds, including Barn owl were recorded during internal and internal inspection of the main building, although It was not possible to fully examine the intermediate areas between roofing membrane and tiles; nor was it possible to inspect a small, sealed-off, apex void on the east elevation extension, above the ground-floor bathroom area.

6. Minor evidence of bats was recorded by way of 3-4 bat droppings recorded at floor level in the upper apex area of the brick-built outbuilding; although these were not considered as being fresh (more than a 3 seasons old). **NO** evidence of nesting birds including Barn owl was recorded.

Desk top study

7. Pre-survey data shows the application area is in designated Green Belt with the the northern side of High Lane and Breach Road designated Special Landscape Area. There are a number of statutory or non-statutory designated sites located within a 1-2km radius of the proposed application area. At a local level, pre-survey data shows four species of bat present within a 2km search radius of the proposed application area, with a Common pipistrelle maternity roost (N>55) located ca. 655m due North.

Presence/absence activity surveys

8. Bat activity during both dusk emergence surveys was found to be low overall, with only three individual Common pipistrelle bats visually recorded intermittently, and at any one time. Peak activity times occurred shortly after sunset, indicating a roost is close-by. **NO** bats were seen emerging from any of the buildings onsite. Similarly, overall bat activity was low during the dawn re-entry. However, an individual Common pipistrelle bat was recorded as having some affinity to the main house, whereby it was seen circling and landing on the west elevation roof section, before vacating across the road in a north-westerly direction.

Ecology of bat species onsite

9. **NO HIGH STATUS BAT ROOSTS** are predicted onsite. Minor evidence would infer a potential satellite roost for individual Common pipistrelle, although no roosting bats were recorded during the survey period. This species are known to switch and show less fidelity to roost sites than other species.

Ecological value of building unit(s)

10. Given the number of crevice-dwelling roost features around structures, coupled with the behaviour of Common pipistrelle, the main dwelling is considered as having **moderate to high ecological value** for individual crevice-dwelling bats, although no roosts were currently recorded *in-situ.*

Impact assessment

11. Overall impact is considered as being **LOW**, with **NO HIGH IMPACT BAT ROOSTS** (i.e. maternity roost) predicted in any of the building structures proposed for removal, nor within the Zone of Influence. **NO** impact to any statutory or non-statutory designated areas is predicted. It is considered that the proposed redevelopment would have **NEGLIGIBLE impact to any foraging and commuting habitat.**

12. **NO** impact to birds including Barn owl is predicted. However, where possible, works should be undertaken outside the bird breeding season (mid March – August). If this is not possible, then should any active bird nests be found during works, then these should be left undisturbed until offspring have fully fledged.

Mitigation Licence

13. As **NO** bats were recorded roosting within the proposed application area, **it will NOT** be necessary to apply for a European Protected Species (EPS) licence from Natural England. However, in the event that individual Common pipistrelle may adopt the building over space and time, a number of **site safe-guard measures** are recommended.

Recommendations & Conditions *(see section 6.4)*

Onsite supervision:

14. A precautionary 'soft demolition' approach to any roofing repair works proposed onsite (or any works that may encroach into roof sections). This should be carried out under the supervision of suitably qualified bat ecologist, in the event that individual bats may be present. **Should any bats be discovered prior to, or during works (or suspicion arise about the possible presence of bats), then all works must cease immediately**.

Timing of works:

15. In general, works can be carried out between October – April, when bats have vacated to hibernation roosts. However, due to the synanthropic nature of Common pipistrelle, it is recommended that any roofing works should be carried out between September to October, when bats are highly transient between autumn swarming sites and winter roosts. In the unlikely event that individual bats are encountered during works, any such individuals would be enabled to naturally disperse under their own volition, whilst there is still sufficient resources in the surrounding landscape for bats to utilize, prior to the onset of winter.

Roost compensation:

16. Where possible, all sustainable developments should consider providing sustainable roost compensation / enhancement for local bat populations, that may be inadvertently displaced or impacted upon during pre and post development. It is recommended that any new build(s), which may supersede the existing buildings proposed for demolition, incorporates at least two external bat boxes within it's design.

17. However, due to the close proximity of a busy public highway, it is not advised to locate such roost boxes along the western elevation and frontage, due to increased risk of mortality from road traffic collision. Instead, bat boxes should be located towards the eastern boundary, which extends out into open countryside (or as far away from the roadside as possible). Further recommendations are made with regard to any pre/post development lighting and Biodiversity enhancement.

CONTENTS

1. INTRODUCTION

1.1 Site description

1.1.1 This report has been prepared at the request of the client, Mr. Richard Clowes, in relation to the identification of protected bat and bird species at Ivy Cottage, High Lane, Brown Edge. ST6 8RU. (OS grid reference:SJ905527).

1.1.2 The proposed development is located in a greenbelt area of the Staffordshire Moorlands, on the fringe of the Potteries Urban area. It is located immediately adjacent to the B5109, ca. 8km north east of Hanley, Stoke-on-Trent.

Figure 1. Location of site (red star) in context to the surrounding landscape (source:www.gridref.org.uk).

1.1.3 The objective of this report is to provide the client with information on the known and potential bat roosts and birds nesting within the building, and to outline recommendations on how to proceed with the works in a legal and ecologically sensitive manner, should bats and birds be resent. As defined in Planning Policy Statement 9 (ODPM, 2005) (now superseded by the National Planning Policy Framework - NPPF 2012), Biodiversity and Geological Conservation sites of biodiversity conservation value and protected species are material considerations in the planning process.

1.2 Proposed works

1.2.1 It is understood that the currently unoccupied residential dwelling and out-building is to be demolished.

1.3 Aims of survey

1.3.1 The scope of this appraisal has been determined in line with the proportional approach to ecological survey, assessment and subsequent recommendations for avoidance and mitigation of impacts, which is encouraged in the emerging 'BS 42020: Biodiversity – Code of practice for planning and development'. This report has been prepared with due consideration for various best practice guidance and methodologies including those of the Chartered Institute of Ecology and Environmental Management (CIEEM (2012)1, the emerging BS 42020 and the Bat Conservation Trust Best Practice 2012.

1.3.2 The aims of the Stage 2 presence/absence activity surveys is to provide an ecological evaluation of the following species within the proposed application area:

• Bats
- Probability of bats and their roost sites being present at the proposed redevelopment 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.

Table 1. Aims of survey in relation to bats.

1.3.3 A bat roost is interpreted as 'any structure or place, which any wild bat uses for shelter or protection. Bats tend to show a high fidelity to roosts. Subsequently, legal opinion regards a roost to be protected whether or not the bats are present at the time. There are many types of roost used by temperate bats during their annual cycle: Any structures found having evidence of bats will be further evaluated to assess which of the following roost categories may be present onsite (if any).

1.3.4 The survey protocol also considers all common wild birds that are protected under The Wildlife and Countryside Act 1981 (and as amended):

• Birds
• Establish if birds are using the site.
• Locate nest sites, if present.
• Assess what types of activities were shown within the redevelopment site.
• Assess suitable food resources and habitat requirements.
• Provide an impact assessment, if nests are found.

Table 2. Aims of survey in relation to birds.

1.3.5 Certain rare breeding birds such as Barn Owl (*Tyto* alba), are listed on Schedule One of The Wildlife and Countryside Act 1981 (and as amended). Under this legislation they are afforded the same protection as common wild birds, and are also protected against disturbance whilst building a nest or on or near a nest containing eggs and unfledged young. Survey protocol considers the following:

• Barn Owl
• Establish presence onsite.
• Establish potential nest sites (PNS).
• Locate any active roost sites (ARS).
• Locate any temporary roost sites (TRS)
• Assess potential feeding and dispersal habitats (PFH)
• Provide an impact assessment, should barn owl(s) be present

Table 3. Aims of survey in relation to Barn Owl.

1.3.6 Assessment also considers potential effects on valued ecological receptors (VERs) and zones of influence (ZoI) during pre and post development, both onsite and off- site. The term Zone of Influence is used to describe the geographic extent of potential impacts of a proposed development. Should a likely significance of negative impacts be identified, further surveys, mitigation and enhancement measures will then be determined accordingly; to prevent, offset or reduce the degree of impact that may occur should development commence.

1.3.7 Should bats be present onsite, then a European Protected Species (EPS) development license issued by Natural England (NE) may be required prior to any works taking place. If required, further presence/absence survey should be undertaken and a mitigation strategy be implemented with Natural England and the Local Planning Authority. Should no further surveying effort be considered, then the PEA report will include full justification and evaluation.

2. SURVEY METHODOLOGY

2.1.1 The aims of this activity survey report is to provide an ecological evaluation of the site in relation to protected bats and birds and considered appropriate to achieve the aims and objectives discussed in section 1.3.

2.1.2 The following survey protocol was considered appropriate to provide a full ecological valuation of the site in relation to protected bat and bird species, in order to determine the following aims and objectives:

- What impact the redevelopment is 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.

2.1.3 In accordance with BCT 2nd edition (2012) guidelines, the following survey methodology is considered appropriate to achieve the aims and objectives:

2.2 Pre-survey data search

2.2.1 Pre-survey data search provided historical records of any protected bat and bird species found within a 2km radius of the application area. Additional ecological data has been sourced to understand any constraints that the proposed planning application may have on species and habitat in the wider landscape. A number of electronic sources sites were consulted including; www.magic.gov.uk; www.naturalengland.org.uk; Google Earth and www.ordinancesurvey.co.uk.

2.3 Surveyor information

2.3.1 All surveys were undertaken by 2/3 surveyors and overseen by a Natural England licensed bat ecologist and member of the Chartered Institute of Ecology and Environmental Management (CIEEM):

- **Mark Weston** – BSc (Hons), MIEEM, Natural England Bat Licence (CLS00836 – Level 2). Mark has specialized in bat ecology for over five years, being actively involved in scoping, presence/ absence surveys and method statement preparation with regard to planning and the law. He has a First Class Honours degree in Conservation Biology and awarded the Vice-Chancellor prize for academic excellence. He is also an associate lecturer in ecological sciences at the University of Derby, and has undertaken a number of BCT training courses and conferences concerning bat ecology, bats and the law, mitigation and echolocation sound analysis. He is a member of the Bat Conservation Trust (BCT) and Derbyshire Bat Conservation Group (DBCG).
- Assistant ecologist(s): **Melissa Loughran** BSc (Hons) / **Amy Dowers** BSc (Hons)

2.4 Field Surveys

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Inspection of Hibernation roosts- semi optimal survey			Limited activity-sub optimal	Summer roost emergence & re-entry surveys -Optimal survey period					Limited activity -sub optimal	Hibernation roosts - semi optimal survey	
Internal roost surveys are possible / Trees are best surveyed during Winter											

Table 4. Annual survey optimality for bats.

2.4.0 All field surveys were conducted during an optimal period of the bat surveying season and with sufficient intervals between surveys to allow for any stochastic events over space and time. Weather conditions were optimal throughout all survey periods (Temp: >8°C / dry conditions). Assessment incorporated the use of binoculars, torch, endoscope and ladders where necessary.

2.4.1 Habitat survey

2.4.1.1 The survey assessed habitat onsite in context to the wider landscape with regard to any important bat roosts, commuting/foraging areas that may be affected by the proposed development.

2.4.2 Roost surveys

2.4.2.1 All potential roost structures (i.e. buildings) onsite or within the Zone of Influence of the proposed development were assessed, based on standard methodologies set out by Natural England, the Bat Conservation Trust (BCT) and the Joint Nature Conservation Committee (JNCC). External inspection considered suitable ingression points where species such as bats and birds could gain entry into any structures to roost and/or nest.

- Condition of roof i.e. missing or raised roof tiles
- Condition of windows and doors i.e. broken panes.
- Potential ingression points around ridges and apex of the buildings.
- Any anecdotal evidence of bats I.e. droppings, grease marks, feeding remains.
- Any evidence of birds i.e. nest material, droppings.

2.4.2.2 The external inspection incorporated visual assessment with the use of torch, endoscope and ladders to ascertain the following:

- Any potential internal roost features i.e. non-illuminated areas, joints, crevices, beams and cavities.
- To locate potential roost/nest sites.
- To listen for an bats and birds.
- To examine floors, walls and structural elements for anecdotal evidence i.e. droppings, urine stains, corpses and feeding remains.

- **Bat Roost Categories**

2.4.2.3 Daily food digestion, assimilation and availability, in association with annual embryonic gestation, parturition and lactation (females) are all factors that determine appropriate roost selection for different bat species and individual fitness of conspecifics.

4.4.2.4 Temperature, relative humidity, air flow, morphology, and protection from the external environment are all considered as predictors that may be used in determining roost potential. While none of these factors can be considered as being mutually exclusive, temperature is long regarded as being the most important physical influence regarding roost selection by bats. The optimal temperature for roosting bats can vary between species and body condition amongst conspecifics during different phases of their annual cycle.

4.4.2.5 A bat roost is interpreted as ‘any structure or place, which any wild bat uses for shelter or protection’ (i.e. buildings, trees, bridges, tunnels etc.). Bats tend to show a high fidelity to roosts. Subsequently, legal opinion regards a roost to be protected whether or not the bats are present at the time. There are many types of roost used by temperate bats during their annual cycle: Any structures found having evidence of bats will be further evaluated to assess which of the following roost categories may be present onsite (if any):

Status	Description
Maternity / Nursery Roost	*used by breeding bats, where pups are born and raised to independence (Anecdotal evidence may support this prospect despite sub-optimal survey period).*
Hibernation Site	*where bats may be found during the winter. (This is assessed within the context of this report).*
Satellite Summer Roost	*used by males and/or non-breeding females (Seasonal limitations prevent robust analysis of this).*
Night Roost	*where bats rest between feeding bouts during the night but are rarely present during the day.*
Feeding Roost	*where bats temporarily utilize feeding perches and stations to eat an item of prey.*
Transitional (or Swarming) Site	*where bats may be present during the spring or autumn (This can not be assessed within the context of this report).*

Table 5. Bat roost status definitions

Building Rating

2.4.2.6 In the absence of any evidence, trees and structures were assigned a rating of suitability from negligible to high potential for supporting bats. The rating is based on the number and type of features suitable for use by bats (such as rot holes, cavities and raised bark), location of the structure in the surrounding landscape and surveyor's experience (e.g. 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).

2.4.3 Activity surveys

2.4.3.1 Activity surveys combined an overall assessment of any *in-situ* roost onsite, and any other Valued Ecological Receptors (VERs) considered to be within the Zone of Influence (ZoI) of the development, whilst considering any important commuting and foraging routes used by bats.

All activity surveys were undertaken in accordance with the guidelines published by the BCT (2007) 2nd edition 2012 to ascertain the following:

- Determine the presence/absence of species, i.e. the species present in a given area
- Determine the intensity of bat activity both spatially and temporally
- Determine the type of activity i.e. foraging (by feeding buzzes);commuting (by high directional pass rates); mating (by mating social calls)
- Find roosts by tracking back bat flight paths or observing dawn swarming behaviour

- **Dusk emergence bat survey**

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

- Being at the site 1 hour before sunset;
- Listening for social calls at potential roost sites;
- Standing at different transect points around the buildings, to record any emerging bats and egress points;
- Standing at different transect points to assess foraging/commuting areas;
- Carrying out survey up to 1.5 - 2 hours after sunset to holistically consider interspecific differences between different bat species

- **Dawn re-entry bat survey**
- Being at the site 2 hours before sunrise;
- Listening for social calls at potential roost sites;
- Standing at different transect points around the buildings, to record any swarming behaviour around potential re-entry points;
- Standing at different transect points to assess foraging/commuting areas.

2.4.3.3 Bat ultrasound data was gathered using a number of heterodyne units (Batbox Duet and SSF Bat2) and real-time recording devices (*EcoObs* Batcorder). Real time recordings were subsequently analyzed using BatSound v4.03 and statistical algorithm analysis was carried out using *EcoObs* BcAdmi, BatIdent and BcAnalyze software to provide an unbiased discrimination of species onsite.

2.4.3.4 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.

- **Weather conditions and timing**

2.4.3.5 All surveys were carried out during optimal survey conditions.

Survey 1: Dusk emergence			Date: 17.06.2015
Temp Start	13°C	Cloud Cover Start	90%
Temp Finish	10.8°C	Cloud Cover Finish	90%
Humidity Start	64.7%	Wind Speed Average	Nil <1
Humidity Finish	67.2%	Precipitation	Nil
Survey 2: Dawn Re-entry			Date:23.05.2015
Temp Start	9.7°C	Cloud Cover Start	50%
Temp Finish	11.2 °C	Cloud Cover Finish	40%
Humidity Start	69.5%	Wind Speed Average	Nil <1
Humidity Finish	68.9%	Precipitation	Nil
Survey 3: Dusk emergence			Date: 26.06.2015
Temp Start	11.5°C	Cloud Cover Start	55%
Temp Finish	10.4°C	Cloud Cover Finish	60%
Humidity Start	69.5%	Wind Speed Average	Nil <1
Humidity Finish	71.9%	Precipitation	Nil

Table 6. Abiotic variables during survey periods.

- **Surveyor location**

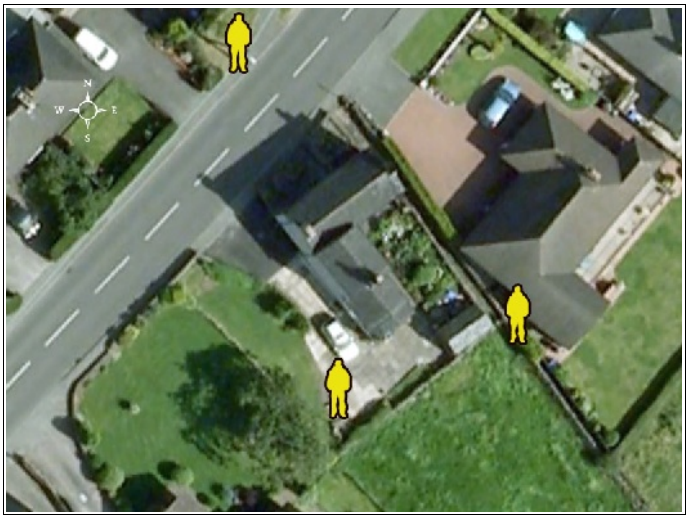

Figure 2. Surveyor location during activity surveys.

3. RESULTS

3.1 Pre-survey data search

3.1.1 Designated sites

3.1.1.1 The settlement of Brown Edge is contained under **Area Green Belt 64 Potteries and Churnet Valley & Special Landscape Area**. The land surrounding Brown Edge is designated Green Belt with the the northern side of High Lane and Breach Road designated Special Landscape Area. There following statutory or non-statutory designated sites are located within a 1-2km radius of the proposed application area.

Table 7. **Designated Areas of Ecological Significance** (e.g. SSSIs / SPAs / Nature Reserves / SBIs / SACs)		
National Nature Reserves: Marshes Hill Common, 300m N of Brown Edge		
SBI's		
• **Marshes Hill**, approx. 300m N of Brown Edge	**Stonehouse Drumble,** stream 300m W of Upper Stonehouse Farm, NW Brown Edge	**Greenway Bank** (incorporating Knypersley Reservoir), 1km NW of Brown Edge
There are no RIGs, SSSIs, SPAs, SACs or BASs within or surrounding Brown Edge.		
Ancient / Semi-Natural Woodland:		
• **Dallows Wood** (SJ892547, 3 ha)	• **Tinster Wood,** approx. 300m SE of BrownEdge	
• **Dalehouse Wood** (SJ916557, 4 ha), located approx. 1.75 km NE of Brown Edge	• Woodland north of **Hollin Wood**, located NE of Knypersley Reservoir, approx. 1.4km NW of Brown Edge	

3.1.2 Protected species

3.1.2.1 Pre-survey data finds seven British bat species are currently given UK BAP (2007) Priority Species Status. National Biodiversity Network and Staffordshire Wildlife Trust (SWT) records show that 11 of the 17 resident UK bat species occur in the county with two UK BAP species being recorded within 2km of the proposed application area (highlighted in grey):

UKBAP	Common name	Species	Recorded within 2km
☑	**Brown long-eared bat**	*Plecotus auritus*	☑
☑	**Barbastelle bat**	*Barbastella barbastellus*	☒
☑	**Bechstein's bat**	*Myotis bechsteinii*	☒
☑	**Noctule**	*Nyctalus noctula*	☑
☑	**Greater horseshoe bat**	*Rhinolophus ferrumequinum*	☒
☑	**Lesser horseshoe bat**	*Rhinolophus hipposideros*	☒
☑	**Soprano pipistrelle**	*Pipistrellus pygmaeus*	☒

Table 8. UKBAP Bat species recorded in Staffordshire.

3.1.2.2 A further four/five bat species that are not currently given UK BAP consideration are also recorded within the county.

UKBAP	Common name	Species	Recorded within 2km
☒	**Natterer's bat**	*Myotis Nattereri*	☒
☒	**Daubenton's bat**	*Myotis daubentonii*	☒
☒	**Whiskered/ brandt's bat**	*Myotis mystacinus/brandtii*	☑
☒	**Common pipistrelle**	*Pipistrellus pipistrellus*	☑

Table 9. Non UKBAP Bat species recorded in Shropshire/Staffordshire.

3.1.2.3 At a local level, SER show four species of bat within a 2km search radius of the proposed application area;

Species	Number of records / Period	Nearest recording within 2km of site
Whiskered bat;	2 / 2002-2014	1669m / field observation / GR: SJ89385174
Common pipistrelle;	55 / 1979-2011	655m north / Breeding Roost N=52 / GR: SJ907532
Noctule	1 / 1990	1923m / field observation / GR: SJ902547
Brown long-eared bat	8 / 1970-1992	627m / field observation / GR: SK09183404

Table 10. Bat species recorded in 1km radius of proposed application area.

- **Birds**

3.1.2.4 Species are classified according to their status on Red and Amber lists of Birds of Conservation Concern (BoCC) in the UK. Staffordshire Ecological Records show **43** records (1990-2013) of field observations of Barn Owl within a 2km radius of the application area. No records of protected bird species are recorded in the application area

3.2 Field surveys

3.2.1 Habitat Description

3.2.1.1 Ivy Cottage is located within the settlement of Brown Edge, which comprises of Ancient slope & Valley Farmlands and Gritstone uplands character types (the latter being to the north-east and extends south from Biddulph Moor). Ivy Cottage is accessed immediately off the B5109, which joins onto the A53 to Leek to the east, and continues west to Stoke-on-Trent. The property backs onto an open area of semi-improved grassland to the rear, whilst being abutted by neighbouring residential houses to the north and south. A public footpath is located immediately along the northern boundary,

Geology

3.2.1.2 The far western and south-western part of the settlement (along Woodhouse Lane and High Lane) are underlain by Coal Measure Group (argillaceous rocks, undifferentiated).

Topography

3.2.1.3 The northern section of the village is a scattered ridgeline settlement based around landscape moorland features. It is very hilly, with many open spaces and wide skylines. The southern core of the village is a more consolidated settlement. There are panoramic views to the west. The landscape setting relates to areas of a strong established landscape structure, generally characterised by irregular fields bounded by hedgerows, with hedgerow trees and vegetated streamlines. Transitional landscape along the eastern edge has a more upland character.

3.2.1.4 A large expanse of water is located ca. 1km north-west at Knypersley Reservoir which is surrounded by woodland. Several smaller patches of woodland also exist to the NE of the settlement. An area directly to the north of Brown Edge is defined as 'unimproved land' (Marshes Hill). Subsequently the area is considered as providing excellent habitat and resources for both bats and birds, with good connectivity to the wider landscape considered.

Figure 3. Location in context to the wider landscape..

3.2.2 Roost survey

- *External Inspection*

3.2.2.1 The site is ca.340m^2 in total area, and comprises of a two-storey double brick dwelling (unoccupied), with a number of pitched, tiled roof elevations. All doors and windows of the main dwelling were found to be intact and well sealed. A number of ingression points for bats were however recorded around the roof sections, by way of raised/missing roof and ridge tiles. Furthermore, a number of small crevices and gaps around flashing and tile over-hangs were also recorded around the east gable-end section.

3.2.2.2 A small, single-storey, brick-built storage shed is located to the rear of the building. **NO** evidence of bats or birds was recorded during the external inspection.

Table 11. External assessment of structures

Figure 4. South-west elevation.

Figure 5. South-east elevation.

Figure 6. east elevation.

Figure 7. brick-built shed on NE corner.

- *Internal Inspection*

3.2.2.3 Internal inspection was gained into all ground floor and first floor areas. There are two separate roof void areas which were gained via loft hatches in first floor bedroom areas. The first roof void inspected was located at the front of the building, running in a north to south direction. The void measured ca 8m x 4m x 1.6 x m, with an overall cubic volume of ca.25m^3 .

3.2.2.4 The roof void was found to be well-sealed, with only minimal light ingress recorded around pinning points on gable-end sections. The A-frame timber truss roof was fitted with modern breathable roofing membrane (BRM), which prevented a fuller inspection of any intermediate areas between membrane and tiles. This BRM would indicate the roof has been renewed in the last ten years. The floor was found to be heavily insulated with fibre-glass resulting in a warm, desiccated and dusty void area overall. **NO** evidence of bats or birds recorded in this section.

3.2.2.5 The second roof void inspected was located to the side of the property running in an east to west direction. The void measured ca 5m x 4m x 1.6 x m, with an overall cubic volume of ca. 16m^3 . Similarly, the void was found to be well-sealed, with only minimal light ingress recorded around pinning points on gable-end sections. The A-frame timber truss roof, with additional timber up-rights was fitted with BRM, which prevented a fuller inspection of any intermediate areas between membrane and tiles. The floor was found to be heavily insulated with fibre-glass resulting in a warm, desiccated and dusty void area overall. **No** evidence of bats or birds were recorded in this section.

Table 12. Internal assessment of structures

Figure 8. Roof void running North to South.

Figure 9. Modern BRM fitted to roof.

Figure 10. Roof void running East to West.

Figure 11. roof void area in brick-built shed.

3.2.2.6 A separate, small roof void is located above the ground-floor bathroom area along the east elevation, whereby no access could be gained into this section, preventing inspection.

3.2.2.7 A small roof void was recorded in the apex area of the outbuilding located towards the rear of the property. The void measured ca. 3m x 2m x 0.8m with an overall cubic capacity of ca. 2.4m^3. The area was found to be more exposed to the external environment and lacked any roofing underfelt, with a good degree of light ingress recorded. Minor evidence of bats was recorded by way of 3-4 bat droppings found at floor level. These were not considered as being fresh and more than a few seasons old. No evidence of nesting birds was recorded in this section.

3.2.3 Activity surveys

- *Dusk emergence*

3.2.3.1 Bat activity during both dusk emergence surveys was found to be low overall, with only three individual Common pipistrelle bats recorded at any one time, with Noctule intermittently present in the surrounding landscape. Common pipistrelle was recorded shortly after dusk during the second survey period, suggesting a roost is close-by [Ref: Pre-survey data / Common pipistrelle Breeding Roost N=52 / 655m north / GR: SJ907532]. Conversely, **NO** bats were recorded emerging from any of the structures proposed for removal during dusk emergence surveys.

Table 14. Survey 1 – Dusk emergence				Date: 17.06.2015
Species	**Confidence**	**passes recorded**	**Notes**	**Roost**
Noctule (*Nyctalus noctula*)	σ = 100%	*n* = 3	characteristically recorded commuting at height, shortly after dusk [21:30hrs]	NO
Common Pipistrelle (*Pipistrellus pipistrellus*)	σ = 100%	*n* = 16	Single individual recorded transiently commuting over site during 21:44 – 22:30hrs.	NO
Number of species recorded	2	**Level of Commuting / foraging** (based on level of 'feeding buzzes')		LOW / TRANSIENT
Total number of bat passes recorded	N = 19	**Peak activity time**		21:44 – 22:10hrs

Table 15. Survey 2 – Dusk emergence				Date: 26.06.2015
Species	**Confidence (%)**	**passes recorded**	**Notes**	**Roost**
Common Pipistrelle (*Pipistrellus pipistrellus*)	σ = 100%	*n* = 23	Single individual x 2 recorded transiently commuting over site at separate times, during 22.15 – 22:30hrs.	NO
Number of species recorded	1	**Level of Commuting / foraging** (based on level of 'feeding buzzes')		LOW / TRANSIENT
Total number of bat passes recorded	N = 23	**Peak activity time**		22.15 – 22:30hrs.

3.2.3.2 Bat activity during the dawn re-entry survey was once again seen as being low overall, with a total of only 32 bat passes recorded. All activity was intermittently recorded shortly before dawn. A single Common pipistrelle bat was recorded as showing some affinity to main house, and was seen circling and landing on the west elevation roof section, before vacating in a north-westerly direction. Whilst the building may have some function as a temporal satellite roost for individual Common pipistrelle bat over space and time, **NO** bats were recorded re-entering into the building(s), during the survey and **NO** High impact roosts are considered.

Table 16. Survey 3 – Dawn Re-entry				Date: 23.06.2015
Species	**Confidence (%)**	**passes recorded**	**Notes**	**Roost**
Common Pipistrelle (*Pipistrellus pipistrellus*)	σ = 100%	*n* = 23	Recorded transiently 45mins before sunset at 03:18 – 03:35 hrs. Single individual recorded at 4:10am (sunrise 4:15am) landing on house roof on west elevation, before departing off site in a north west direction	Temporal affinity to the building by a single Common pipistrelle may indicate a satellite roost for individual bats
Myotis sp.	Genus σ = 100% / Whiskered/Brandt's σ = 64%	9	Myotis bat recorded flying over site in an east to west direction	NO
Number of species recorded	2	**Level of Commuting / foraging** (based on level of 'feeding buzzes')		LOW / TRANSIENT
Total number of bat passes recorded	N = 32	**Peak activity time**		22.15 – 22:30hrs.

- **Birds**

3.2.3.3 The building provides low potential for nesting birds and **NO** evidence of Barn Owl was recorded.

4. ASSESSMENT

4.1 Constraints on survey information

4.1.1 It was not possible to fully examine the intermediate areas between roofing membrane and tiles in the upper roof void compartments of the main dwelling; nor was it possible to inspect a small, sealed-off apex void area on the east elevation extension, above the ground-floor bathroom area. However, based on presence/ absence activity surveys conducted during an optimal time of the year, assessment of buildings were considered to be robust overall.

4.2 Constraints on equipment used

4.2.1 No constraints were encountered on equipment used (i.e. bat detectors, endoscope, ladders and high powered binoculars).

4.3 Potential Impacts of development

4.3.1 Designated sites

4.3.1.1 **NO** impact to designated sites is predicted**,** and **NO** impact to habitat in the wider landscape is considered.

4.3.2 Roosts

4.3.2.1 The overall assessment is confident that **NO HIGH IMPACT BAT ROOSTS** (i.e. maternity roost) are present within any of the structures proposed for removal, nor within the Zone of Influence.

4.3.2.2 However, a single Common pipistrelle bat was recorded as showing some affinity to the building during the dawn survey, although no re-entry was recorded. Given the number of crevice-dwelling roost features onsite, coupled with the ability of this species to switch between roosts and exploit a greater spectrum of regimes; there may be potential that this building may serve intermittently as a temporal satellite roost for individual Common pipistrelle bat over space and time. Overall impact based on demolition of building(s) is considered as follows:

Impact roost assessment for bats			
BUILDING	**Short-term: Disturbance**	**Long-term: Roost modification**	***Long-term: Roost loss**
Ivy Cottage	**NO HIGH IMPACT ROOST(S) RECORDED** **LOW TO MODERATE** disturbance of potential satellite roost considered for individual Common pipistrelle	**LOW TO MODERATE** modification of potential satellite roost considered for individual Common pipistrelle. More preferential habitat considered in the surrounding environment	**LOW** More preferential habitat considered in the surrounding environment
Outbuilding	**LOW** Historic evidence of use by individual bats – No active roost predicted	**LOW** More preferential habitat considered in the surrounding environment	**LOW** More preferential habitat considered in the surrounding environment

Table 17. Summary of overall impacts for bats. (**The impact of loss of roosts on bat populations is poorly understood and difficult to study. There is variation in the impacts depending on the particular species of bat with some being more sensitive to disturbance than others. Synanthropic species such as Pipistrelle bats for example are crevice roosters, and are known to move between roost sites (such as maternity roosts). These bats may find it easier to locate suitable new roosts as their requirements are not as specific as other species*).

Impact roost assessment for birds (including barn Owl)			
BUILDING	**Short-term: Disturbance**	**Long-term: Roost modification**	***Long-term: Roost loss**
Ivy Cottage	**LOW**	**LOW**	**LOW**
Outbuilding	**LOW**	**LOW**	**LOW**

Table 18. Summary of overall impacts for birds.

4.3.3 Foraging and commuting habitat

Impact assessment of bat foraging and commuting habitat		
Short-term: Disturbance	Long-term modification	Long-term loss
NEGLIGIBLE	**NEGLIGIBLE**	**NEGLIGIBLE**

Table 19. Summary of impacts on foraging and commuting habitat.

4.3.3.1 It is considered that the proposed redevelopment would have **NEGLIGIBLE** impact on potential foraging and commuting habitat for bats overall.

4.4 Legislation and Policy Guidance

4.4.1 Unlike many smaller mammals, bats have low fecundity with a long and complex life cycle, which is played out over a large spatial landscape. Bats show a strong fidelity to different types of roosts throughout their annual cycle i.e. hibernacula, maternity, bachelor, satellite roosts and feeding perches. Linear features within the landscape such as hedgerows and tree lines are often used by bats for commuting, predator avoidance and foraging.

4.4.2 Bats are highly social animals and loss of a single habitat alone can have a serious impact on populations. The status of many bat populations is tentative, being based on relatively few records and are highly susceptible to habitat loss and fragmentation. As such bats are given protected consideration within the following legislation and policy guidelines:

Legislation and Policy guidelines:

PAS 2010	The published 'PAS 2010' 'Planning to halt the loss of biodiversity' which is the government's new policy aimed at all authorities and developers involved in the planning process in the UK to halt biodiversity decline by 2010 and deliver net biodiversity gains as part of the green infrastructure provisions.
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 Governments 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.
Conservation of Habitats and Species Regulations (2010)	The Conservation of Habitats and Species Regulations 2010 consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994, in respect of England and Wales. It is an offence to possess, sell or offer, or transport for sale any European species of bat or any part derived from such a species. These Regulations also remove the 'incidental result defence'. In other words, it is no longer a defence to show that the killing, capture or disturbance of a species covered by the Regulations or the destruction or damage of their breeding sites or resting places was the incidental and unavoidable result of a lawful activity. Natural England can grant European Protected Species (EPS) licences in respect of development to permit activities that would otherwise be unlawful.
Natural Environment and Rural Communities Act (2006)	Under Section 40 of the Natural Environment and Rural Communities Act (2006), public bodies, including Local and Regional Planning Authorities, have a duty to 'have regard' to the conservation of biodiversity in England when carrying out their normal functions, which includes consideration of planning applications. In compliance with Section 41 of the Act, the Secretary of State has published a list of species considered to be of principal importance for conserving biodiversity in England. This is known as The England Biodiversity List, all of which make up the UK BAP Priority Species. Regional Planning Bodies and Local Planning Authorities will use it to identify the species that should be afforded priority to maintain, restore and enhance species and habitats.
Bird legislation	Most resident nesting birds are protected under the Wildlife and Countryside Act 1981, which protects birds, nests, eggs and nestling's. Some rarer species, such as barn owls, are afforded extra protection.

Table 20. Policy guidelines.

Please note: If bat species are present at the site, the purpose of this report will only summarize the potential requirements for a bat mitigation package or project.

5. RECOMMENDATIONS AND MITIGATION

5.1 Further survey

5.1.1 During the Preliminary Roost Assessment and bat activity surveys, which conform to the BCT guidelines 2nd edition (2012), all effort was made to establish the status of any bat and bird roost(s) onsite. Assessment onsite was undertaken during an optimal survey period and the report findings are considered to be robust overall and representative of protected species currently onsite. **NO** further survey recommendations for bats are considered.

5.1.2 **NO** further survey recommendations are considered for protected bird species (including Barn Owl), on the proviso that care and vigilance is carried out during works. Ideally works should be programmed outside of the bird breeding season, which runs from March to October inclusive. If this is not possible, a check for active nests should be incorporated into any site supervision that may be required for any roofing works (see below).

5.2 Mitigation measures

5.2.1 Proposed mitigation for roost sites

5.2.1.1 Mitigation should be proportionate, justifiable and avoid or minimize any harm to species found during works, and prevent any long-term detrimental effect on any local population. Mitigation for bat roost sites should be proportionate to:

- Type and scale of works and predicted impacts on bats
- Size, nature and complexity of the development site
- Likelihood of bats being present or affected
- Species and numbers of individuals concerned
- Type of roost and/or habitat affected.

5.2.1.2 Whilst **NO** evidence of roosting bats was recorded during the survey period, it should be noted, that the building pertains to features suitable for crevice-dwelling bats. As the building(s) is subject to removal, mitigation should consider the potential utilization of the building over space and time, by individual crevice-dwelling bat species; particularly that of the more opportunistic Common pipistrelle bat (which is known to switch between roosts, and exploit a wider spectrum of features).

5.2.2 Proposed mitigation for foraging and commuting habitat.

5.2.2.1 It is considered that the proposed redevelopment would have **NEGLIGIBLE** impact on potential foraging and commuting habitat for bats, with activity seen as being low overall. The adjacent B5109 road was seen as a being a busy public highway, which may act as a potential dispersal barrier/sink and severs connectivity from east to west. There is more favourable roost habitat for bats considered in the wider landscape.

5.3 Mitigation Licences

5.3.1 As **NO** bats were recorded roosting within the proposed application area, **it will NOT** be necessary to apply for a European Protected Species (EPS) licence from Natural England.

5.3.2 However, as there was minor evidence that Common pipistrelle showed some affinity to the building, and given the number of crevice-dwelling roost features of the buildings onsite, coupled with the ability of this species to switch between roosts; **site safe-guard measures should be considered**, in the event that individual bats may adopt the building over space and time, prior to removal. (see section 6.4).

6. SUMMARY

6.1 Bat presence/absence

6.1.1 Albeit it in very low numbers, Common pipistrelle was seen as the dominant species commuting over site, with Noctule and Whiskered bat transiently recorded also. Overall assessment finds **NO** active roosts onsite, although the building shows minor potential as a Satellite roost for Common pipistrelle over space and time. Overall lack of bat activity may be symptomatic of the site's location next to a busy public highway, whereby high-levels of artificial street lighting may limit overall dispersal potential of bats, with more preferential habitat and resources in the wider landscape considered.

6.2 Roost ecology of species onsite

6.2.1 Activity surveys find **NO** evidence of any **HIGH IMPACT** bat roosts within any of structures proposed for removal. **NO** immediate impact to any VERs within the ZoI is also considered. A general summary of bat species transiently recorded onsite can be found in Appendices.

6.3 Ecological value of building unit

6.3.1 Whilst no active bat and bird roosts were recorded during the survey period, overall assessment considers the buildings to provide **moderate to high** ecological value for individual crevice-dwelling bats, and **low** ecological value for birds including Barn Owl.

6.4 Preliminary Recommendations

- **Bats**

6.4.1 Although no active roost(s) was confirmed as being present, assessment cannot fully rule-out the potential that individual bats may utilize intermediate layers of the roof section, over space and time. As the building is proposed for demolition, the following **site safe-guard** measures **SHOULD** be adhered to:

- ***Onsite supervision:***

6.4.2 Due to proposed demolition of buildings, it is considered prudent to undertake a precautionary **'soft demolition'** approach to any roof sections (or any demolition works that may encroach into roof sections). This should be carried out under the supervision of suitably qualified bat ecologist, in the event that individual bats may be present. All building contractors should be made aware of the possible presence of individual bats, their legal protection and of working practices to avoid harming bats, before any work commences.

- ***Timing of works:***

6.4.3 In general, works can be carried out between October – April, when bats have vacated to hibernation roosts. However, due to the synanthropic nature of Common pipistrelle, it is recommended that any roofing works should be carried out between September to October, when bats are highly transient between autumn swarming sites and winter roosts. In the unlikely event that individual bats are encountered during works, any such individuals would be enabled to naturally disperse under their own volition, whilst there is still sufficient resources in the surrounding landscape for bats to utilize, prior to the onset of winter.

6.4.4 **Should any bats be discovered prior to, or during works (or suspicion arise about the possible presence of bats), then all works must cease immediately**, and a licensed ecologist should be consulted, if not already present at that time. The use of standard capture and exclusion methods can then be deployed to prevent harm to any bats found which will be relocated to a suitable roof void should natural dispersal not occur.

- ***Roost compensation***

6.4.5 Where possible, all sustainable developments should consider providing sustainable roost compensation / enhancement for local bat populations, that may be inadvertently displaced or impacted upon during pre and post development.

6.4.6 It is recommended that any new build(s), which may supersede the existing property proposed for demolition, incorporates at least two bat boxes onsite. Due to the close proximity of a busy public highway, it is not advised to locate such roost boxes along the western elevation and frontage, due to increased risk of mortality from road traffic collision. Instead, bat boxes should be located towards the eastern boundary (or as far away from the roadside as possible) which extends out into open countryside.

6.4.7 Bat boxes should be sited ca. 4-6m in elevation. Due to the lack of any mature trees onsite, 2 x improved treble crevice bat boxes (The Nest Box company) are recommended:

Figure 4. Illustration of crevice-dwelling bat box

Further information of providing access for roosting bats can be found on:

- *Bat Conservation Trust website:* www.bats.org.uk/pages/new_build.html.
- *The Nest Box Company*: www.nestbox.co.uk/Improved-Treble-Crevice-Bat-Box.html
- *NHBS*: www.nhbs.com/schwegler_bat_boxes_eqcat_422.html

- ***Lighting***

6.4.8 Particular consideration should be given to potential light spill that can affect the foraging and commuting strategy of urban bat populations, and should not exceed 200 lumens (150 watts). Where possible, any security lighting should be on a timer setting and faced down to prevent upward light pollution. Height of any lighting columns around the development should not exceed eight metres to further reduce any ecological impact of light pollution. Low-pressure sodium lamps (SOX) fitted with hoods are recommended to direct light below the horizontal plane to minimize upward light spill.

- **Birds**

6.4.9 Whilst **NO impact** is predicted for birds (including Barn Owl), consideration should be given to nesting birds that may adopt structures proposed for redevelopment during the breeding season (mid March – August). Should any active bird nests be found during works, then these should be left undisturbed until offspring have fully fledged. It may be necessary to enforce an exclusion work zone of 5m to reduce disturbance and minimize potential displacement.

6.4.10 In order to increase long term sustainability for local bird populations, a minimum of two nesting boxes (suitable for different species) should be incorporated into any post-development, and should be positioned at ca. 2-4m above ground level, where possible. Once again, these nest boxes should be located towards the eastern boundary, or as far away from the roadside as possible.

Further information can be found on the RSPB website

- http://www.rspb.org.uk/advice/helpingbirds/nestboxes/smallbirds/siting.aspx

- ***Biodiversity enhancement***

6.4.11 It is encouraged that any landscaping relating to the proposed development should encompass native grasses, trees and shrub species to encourage trophic food webs and increase foraging potential for species. No plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 should be planted during any landscaping within this development. For further details of Schedule 9 plants visit the Defra website: www.defra.gov.uk/wildlife-pets/non-native.

7. REFERENCES

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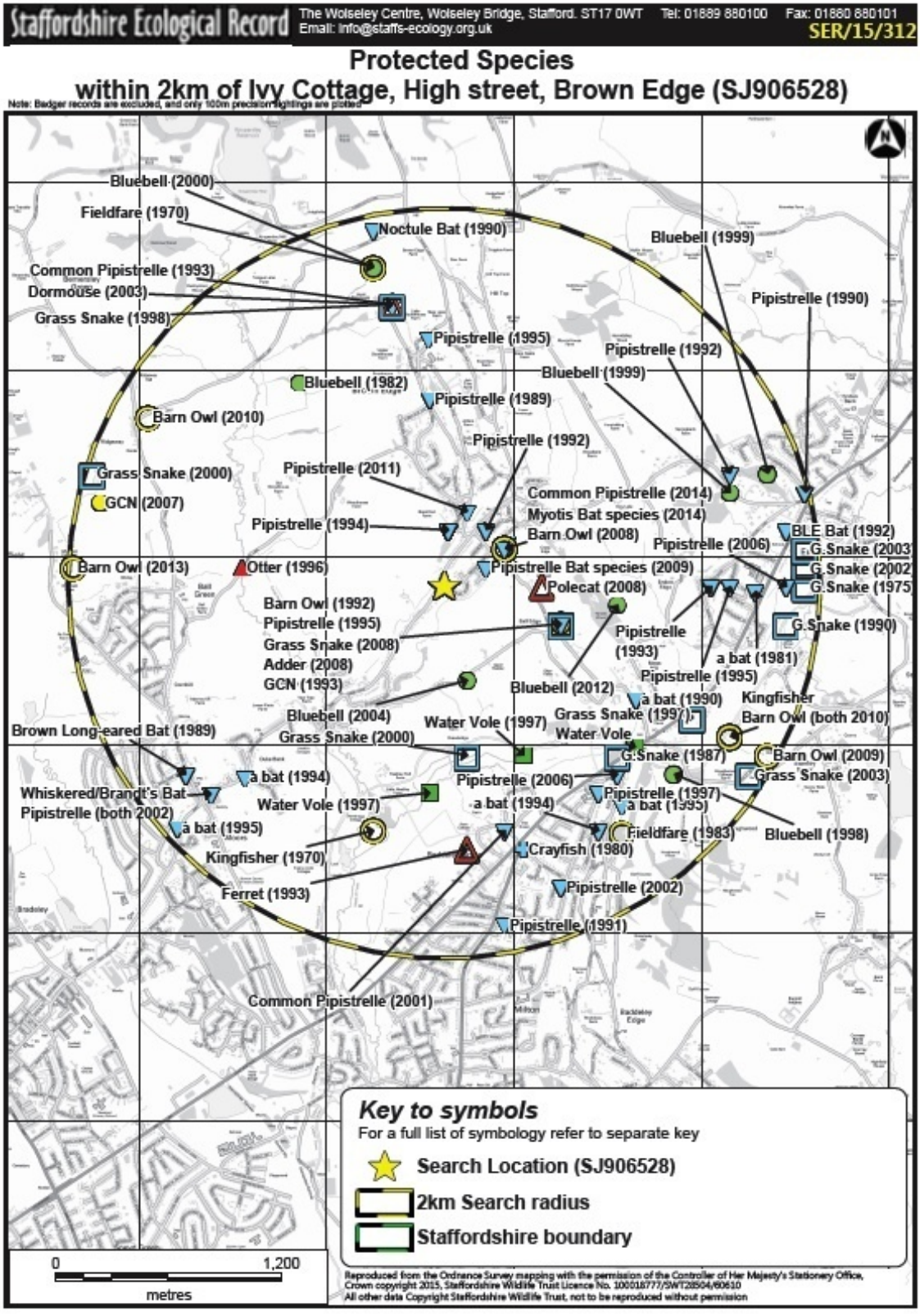
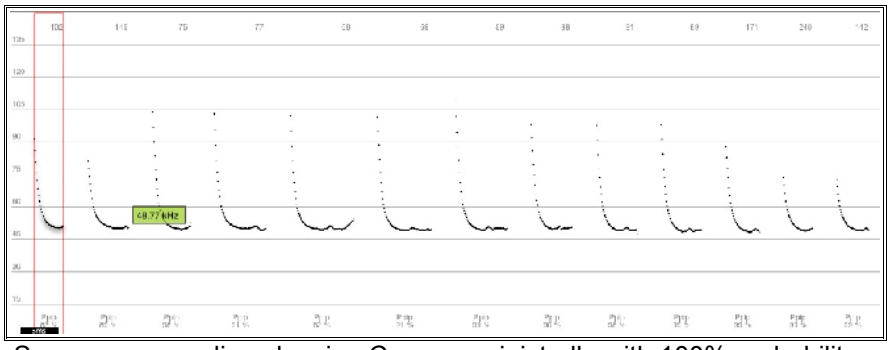
- *Wildlife and Countryside Act 2000 Act 1981 (and amendments)* (c.69 (c.37) London: HMSO.

8. APPENDICES

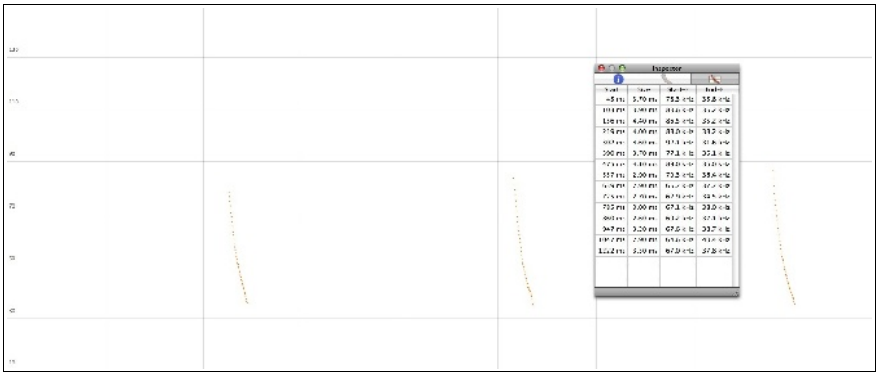
Appendix 1 – Maps and forms



Appendix 2 – Data analysis

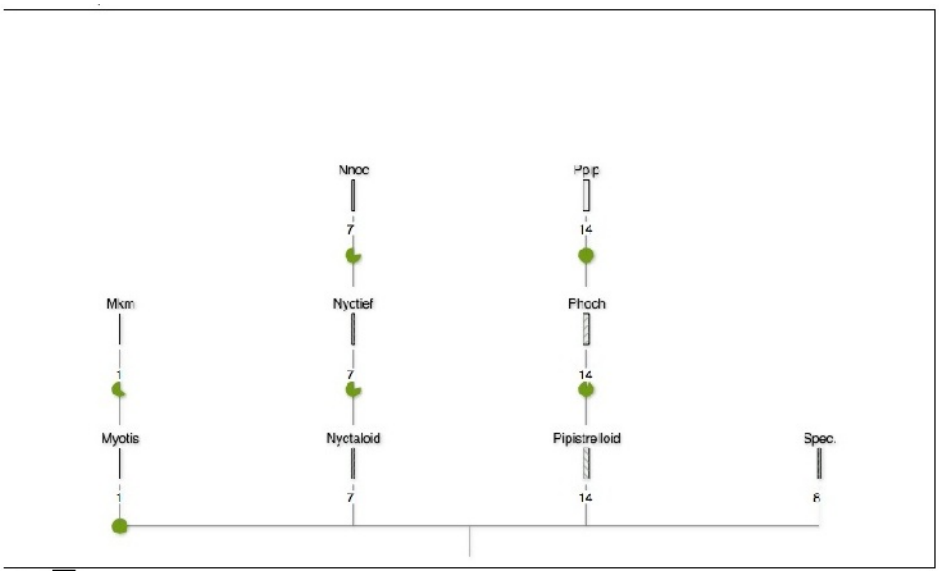


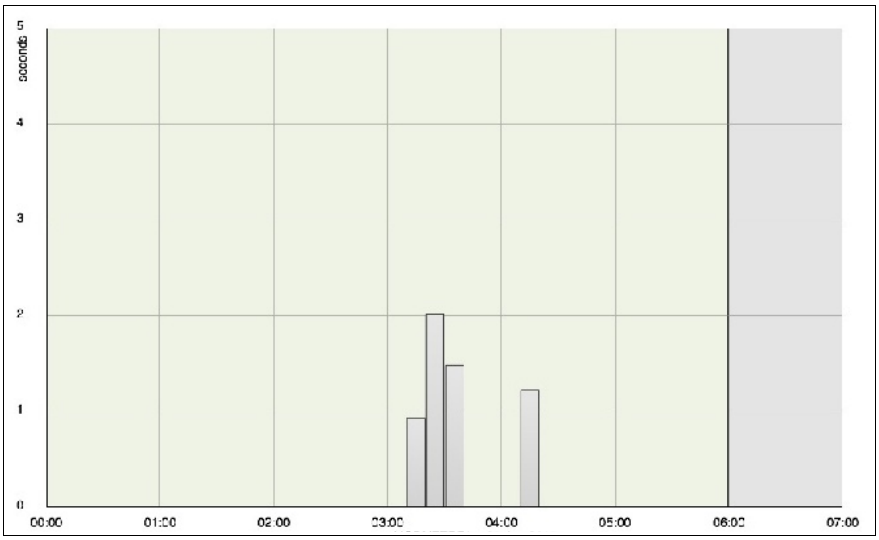
Sonogram recording showing Common pipistrelle with 100% probability



Sonogram recording showing Whiskered/Brandt's bat 64% probability

- Species discrimination analysis





Histogram showing peak activity during dawn survey

Additional information regarding Ecology of
dominant species recorded within 1km radius of application area

Common pipistrelle

- Common pipistrelle was the most dominant of species across site, albeit transient with **NO** High status roosts recorded. However, all buildings pertain features suitable for crevice-dwelling bats,
- Common pipistrelle *P. pipistrellus* is considered common and widespread across local, county and regional levels (Population Estimate: UK 2,430,000, Battersby *et al*. 2005). This species tends to have less roost fidelity overall and are known to switch between roost sites, being more opportunistic in their behaviour. This species may be regarded as being a generalist in behaviour and capable of enduring a greater spectrum of temperature regimes, compared to other crevice-dwelling species.
- Common pipistrelle is generally sedentary in its nature and summer maternity colonies generally number 25-50 individuals (although colonies of >200 have been recorded). Pipistrelle bats are less loyal to roosts than other synanthropic species and are known to alternate (Dietz *et al.* 2009).

Local data records of protected bats in 2km radius

Myotis	Myotis Bat species	mammal - bat	Brown Edge CP	Brown Edge, Staffordshire	SJ90965301	15/08/2014	CHe1 N402
Myotis mystacinus/brandtii	Whiskered/Brandt's Bat	mammal - bat	Norton-in-the-Mo	Endon Road/Norton Lane	SJ8938517	23/08/2002	CFi1 fi1669
Nyctalus noctula	Noctule Bat	mammal - bat	Brown Edge CP	Marshes Hill	SJ902547	02/08/1990	SFielefi1923
Pipistrellus	Pipistrelle Bat species	mammal - bat	Stoke-on-Trent Ci	Caldon Canal, Railway north of Leek New Roa	SJ9050	12/08/2005	Sau2 N2365
Pipistrellus	Pipistrelle Bat species	mammal - bat	Stoke-on-Trent Ci	Caldon Canal, Railway north of Leek New Roa	SJ9050	12/08/2005	Sau2 N2365
Pipistrellus	Pipistrelle Bat species	mammal - bat	Stoke-on-Trent Ci	Caldon Canal, Railway north of Leek New Roa	SJ9050	12/08/2005	Sau2 N2365
Pipistrellus	Pipistrelle Bat species	mammal - bat	Stoke-on-Trent Ci	Caldon Canal, Railway north of Leek New Roa	SJ9050	12/08/2005	Sau2 N2365
Pipistrellus	Pipistrelle Bat species	mammal - bat	Stoke-on-Trent Ci	Caldon Canal, Railway north of Leek New Roa	SJ9050	12/08/2005	Sau1 N2365
Pipistrellus	Pipistrelle Bat species	mammal - bat		ST6 8SQ	SJ908529	14/08/2009	BBa0 R237
Pipistrellus pipistrellus	Common Pipistrelle	mammal - bat	Brown Edge CP	Knypersley, Brown Edge CP	SJ8954	15/07/2006	Sau1 N1985
Pipistrellus pipistrellus	Common Pipistrelle	mammal - bat	Brown Edge CP	Lower Stonehouse Farm	SJ903543	1993	SFi1 fi1512
Pipistrellus pipistrellus	Common Pipistrelle	mammal - bat	Trent Valley River	The Green, Stockton Brook	SJ909515	30/07/2001	SFi1 fi1351
Pipistrellus pipistrellus	Common Pipistrelle	mammal - bat	Brown Edge CP	Brown Edge, Staffordshire	SJ90965301	15/09/2014	CHe2 N402
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Norton-in-the-Mo	Endon Road/Norton Lane	SJ8938517	23/08/2002	CFisefi1669
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Milton (1km sq)	Pool Avenue, Baddeley Green	SJ9050	13/05/1992	SFi3 fi2365
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Milton (1km sq)	Pool Avenue, Baddeley Green	SJ9050	1991	SFi1 fi2365
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Ball Lane, Endon	SJ9052	28/09/1983	SFi1 fi384
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	New Lane	SJ9054541	11/05/1995	SFi1 fi1314
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	Top Heath Row	SJ905538	28/08/1989	SFi1 fi989
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	05/06/1993	SFi5fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	05/07/1993	SFi2fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	06/05/1994	SFi1 fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	06/07/1993	SFi3fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	10/07/1993	SFi4fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	10/08/1991	SFi1 fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	12/06/1992	SFi1fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	13/06/1992	SFi1fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	14/06/1993	SFi5fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	20/06/1992	SFi3fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	21/06/1992	SFi4 fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	22/06/1992	SFi4 fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	24/05/1992	SFi1fi287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	The Dingle	SJ906531	30/04/1993	SField287
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat		ST6 8PR	SJ907532	08/06/2011	BBa5R405
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	Willfield Lane	SJ908531	April 1992	SFi1 fi362
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Trent Valley River	Brompton Drive, Baddeley Green	SJ909510	04/01/1991	SFi1 fi1840
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Stockton Brook (1	Greenside Avenue	SJ912512	15/05/2002	SFi1 D1727
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	Willfield Lane	SJ912526	1995	SFi2 fi655
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Stoke-on-Trent Ci	Blencarn Grove, Stockton Brook	SJ914517	31/08/1997	SFi1fi1381
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Stockton Brook (1	Greenway Hall Road	SJ9151	13/06/1995	SFi1 fi1616
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Stockton Brook (1	Greenway Hall Road	SJ9151	16/07/1990	SFi1 fi1616
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Stockton Brook (1	Greenway Hall Road	SJ9151	21/07/1989	SFi1 fi1616
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Brown Edge CP	Brown Edge	SJ9152	07/07/1985	SFi1 fi942
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Stoke-on-Trent Ci	Stockton Brook	SJ915518	08/08/2006	Sau1 N1367
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Woodstone Avenue, Endon	SJ920528	02/07/1992	SFi2fi1418
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Woodstone Avenue, Endon	SJ920528	07/06/1993	SFi2fi1418
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Woodstone Avenue, Endon	SJ920528	29/06/1993	SFi3fi1418
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Hazelwood Road, Endon	SJ921528	15/07/1995	SFi1M1517
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Clay Lake	SJ921534	07/07/1992	SFielfi1627
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Endon	SJ924528	08/08/2006	Sau1 N1817
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Bagnall CP	Bagnall	SJ9251	27/07/1996	SFi1 c2311
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Stanley	SJ9252	02/05/1985	SFi1 fi1901
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Basnetts Wood, Endon	SJ9252	06/07/1983	SFi7 fi1901
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Basnetts Wood, Endon	SJ9252	12/08/1981	SFi1fi1901
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Basnetts Wood	SJ9252	23/07/1979	SFi1 fi1901
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Clay Lake, Endon	SJ9253	10/06/2009	SSBCg1972
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Hillswood Drive	SJ925533	16/06/1990	SFi1fi1977
Pipistrellus pipistrellus s.l.	Pipistrelle	mammal - bat	Endon and Stanle	Hillswood Drive	SJ925533	1989	SFi1fi1977
Plecotus auritus	Brown Long-eared Bat	mammal - bat	Norton-in-the-Mo	Drakeford Grove	SJ892518	28/09/1989	SFi1 fi1707
Plecotus auritus	Brown Long-eared Bat	mammal - bat	Stoke-on-Trent Ci	Norton-in-the-Moors	SJ892518	28/09/1989	SDe1 N1707
Plecotus auritus	Brown Long-eared Bat	mammal - bat	Brown Edge CP	Knypersley	SJ8954	08/10/1970	SFi1 fi1985
Plecotus auritus	Brown Long-eared Bat	mammal - bat	Brown Edge CP	Knypersley	SJ8954	13/10/1970	SFi1 fi1985
Plecotus auritus	Brown Long-eared Bat	mammal - bat	Brown Edge CP	Knypersley	SJ8954	22/10/1970	SFi1 fi1985
Plecotus auritus	Brown Long-eared Bat	mammal - bat	Brown Edge CP	Knypersley	SJ8954	30/08/1973	SFi1 fi1985
Plecotus auritus	Brown Long-eared Bat	mammal - bat	Endon and Stanle	Kenley Avenue, Endon	SJ924531	08/07/1992	SFi1fi1839

Local data records of Barn Owl in 2km radius

Tyto alba	Barn Owl	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	12/03/2015	WFi1 N2521
Tyto alba	Barn Owl	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	24/11/2014	WFi1 N2521
Tyto alba	Barn Owl	bird	Whitfield Valley LNR		SJ8852	07/07/2013	WFi1 N2152
Tyto alba	Barn Owl	bird	Whitfield Valley LI	Chatterley Whitfield	SJ8853	11/06/2013	WFi1 N2215
Tyto alba	Barn Owl	bird	Whitfield Valley LI	Chatterley Whitfield	SJ8853	12/06/2013	WFi1 N2215
Tyto alba	Barn Owl	bird	Whitfield Valley LI	Chatterley Whitfield	SJ8853	16/03/2015	WFi1 N2215
Tyto alba	Barn Owl	bird	Whitfield (1km sq	Land east of Whitfield Road, Ball Green	SJ886529	07/07/2013	SFi1 N1974
Tyto alba	Barn Owl	bird	Brown Edge CP	Tongue Lane (100m from Bemersley Road)	SJ890537	22/09/2010	BFi1 N1806
Tyto alba	Barn Owl	bird	Brown Edge CP	Fairfield Avenue	SJ909530	17/09/2008	BFi1 N371
Tyto alba	Barn Owl	bird	Brown Edge CP	Willfield Lane	SJ909530	2007	BFi1 N371
Tyto alba	Barn Owl	bird	Brown Edge CP	Fairfield Avenue	SJ909530	September 2008	BFi1 N371
Tyto alba	Barn Owl	bird	Brown Edge CP	Fairfield Avenue	SJ909530	Summer 2005	BFi1 N371
Tyto alba	Barn Owl	bird	Brown Edge CP	Fairfield Avenue	SJ909530	Summer 2006	BFi1 N371
Tyto alba	Barn Owl	bird	Brown Edge CP	Fairfield Avenue	SJ909530	Summer 2007	BFi1 N371
Tyto alba	Barn Owl	bird	Brown Edge CP	Fairfield Avenue	SJ909530	Summer 2008	BFi1 N371
Tyto alba	Barn Owl	bird	Endon and Stanle	Stockton Brook	SJ912526	1992	SFielfi655
Tyto alba	Barn Owl	bird	Bagnall CP	Baddeley Edge	SJ9150	29/04/2006	BFi1 N2517
Tyto alba	Barn Owl	bird	Stoke-on-Trent Ci	Baddeley Green	SJ9151	16/07/1990	WFi1 N1616
Tyto alba	Barn Owl	bird	Stoke-on-Trent Ci	Baddeley Green	SJ9151	16/07/1990	WFi1 N1616
Tyto alba	Barn Owl	bird	Stoke-on-Trent Ci	Stockton Brook	SJ9151	25/11/2008	WFi1 N1616
Tyto alba	Barn Owl	bird	Stoke-on-Trent Ci	Stockton Brook	SJ9152	18/02/2013	WFi1 N942
Tyto alba	Barn Owl	bird	Caldon Canal (canal corridor)		SJ921520	25/11/2010	SFielN1721
Tyto alba	Barn Owl	bird	Bagnall CP		SJ923519	Summer 2009	BFi1 B1944
Tyto alba	Barn Owl	bird	Bagnall CP	behind Field House	SJ9251	2009	BFielN2311
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9252	01/04/2013	WFi1 N1901
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9252	05/07/2012	WFi1 N1901
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9252	07/08/2012	WFi1 N1901
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9252	10/07/2012	WFi2 B1901
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9252	18/01/2007	WFi1 N1901
Tyto alba	Barn Owl	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	20/01/2013	BFi1 N1901
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9252	30/06/2012	WFi1 N1901
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	01/07/2009	BFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	06/07/2012	BFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	08/07/2009	BFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	10/09/2007	WFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	11/12/2007	WFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	13/07/2012	WFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	14/07/2012	BFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	15/12/2011	BFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	20/01/2013	WFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	26/09/2012	WFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	28/06/2012	BFi1 N1972
Tyto alba	Barn Owl	bird	Endon and Stanle	Endon	SJ9253	30/03/2009	BFi1 N1972

Local data records of protected birds in 2km radius

Alcedo atthis	Common Kingfisher	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	01/12/2008	BFix1 N2521
Alcedo atthis	Common Kingfisher	bird	Bradeley (1km sq)		SJ8851	06/12/1983	SFieldfd2521
Alcedo atthis	Common Kingfisher	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	12/06/2006	BFix4 N2521
Alcedo atthis	Common Kingfisher	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	15/05/2014	WFix1 N2521
Alcedo atthis	Common Kingfisher	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	18/11/2014	WFix2 N2521
Alcedo atthis	Common Kingfisher	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	22/11/2014	WFix1 N2521
Alcedo atthis	Common Kingfisher	bird	Whitfield Valley LC	Chatterley Whitfield	SJ8853	17/02/2013	WFix1 N2215
Alcedo atthis	Common Kingfisher	bird	Holden Lane Pool	Holden Lane Pools	SJ8950	April 2006	WFix1 N2616
Alcedo atthis	Common Kingfisher	bird	Holden Lane Pool	Holden Lane Pools	SJ8950	January 2006	WFix1 N2616
Alcedo atthis	Common Kingfisher	bird	Norton Green (1km sq)		SJ8952	07/09/1983	SFieldfd1181
Alcedo atthis	Common Kingfisher	bird	Greenway Bank (R	iver Trent feeder,nr. mill,Greenway bank.	SJ8954	Summer 1978	SFieldfd1985
Alcedo atthis	Common Kingfisher	bird	Trent Valley River System		SJ902515	1970 - 1985	SFix1 B1365
Alcedo atthis	Common Kingfisher	bird	Milton (1km sq)		SJ9050	19/03/1984	SFieldfd2365
Alcedo atthis	Common Kingfisher	bird	Stoke-on-Trent Ci	Baddeley Green	SJ9051	12/12/2008	BFix1 N1368
Alcedo atthis	Common Kingfisher	bird	Stoke-on-Trent Ci	Stockton Brook	SJ9151	02/07/2007	WFix1 N1616
Alcedo atthis	Common Kingfisher	bird	Caldon Canal (canal corridor)		SJ921520	25/11/2010	SFieldN1721
Alcedo atthis	Common Kingfisher	bird	Endon and Stanle	Endon	SJ9252	10/07/2012	WFix1 N1901
Alcedo atthis	Common Kingfisher	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	14/11/2004	BFix1 N1901
Alcedo atthis	Common Kingfisher	bird	Endon and Stanle	Endon	SJ9252	18/03/2012	BFix1 N1901
Alcedo atthis	Common Kingfisher	bird	Endon and Stanle	Endon	SJ9253	08/09/2010	BFix1 N1972
Asio flammeus	Short-eared Owl	bird	Holden Lane Pools (1km sq)		SJ8950	14/05/1984	CFieldfd2616
Asio flammeus	Short-eared Owl	bird	Marshes Hill	Marshes Hill, Brown Edge	SJ9054	03/05/2012	WFix1 N1641
Charadrius dubius	Little Plover	bird	Holden Lane Pool	Holden Lane Pools	SJ8950	01/05/2004	WFix1 N2616
Charadrius dubius	Little Plover	bird	Holden Lane Pools (1km sq)		SJ8950	14/05/1984	CFieldfd2616
Charadrius morinellus	Eurasian Dotterel	bird	Stoke-on-Trent Ci	Brindley Ford	SJ8854	17/04/1998	WFix1 N2679
Cygnus cygnus	Whooper Swan	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	11/11/2007	BFix2 N1901
Cygnus cygnus	Whooper Swan	bird	Endon and Stanle	Endon	SJ9252	25/01/2004	BFix2 N1901
Egretta garzetta	Little Egret	bird	Stoke-on-Trent Ci	Baddeley Green	SJ9051	23/02/2015	WFix1 N1368
Egretta garzetta	Little Egret	bird	Endon and Stanle	Endon	SJ9252	03/09/2012	BFix1 N1901
Falco peregrinus	Peregrine Falcon	bird	Stoke-on-Trent Ci	Milton	SJ9051	01/01/2007	WFix1 N1368
Falco peregrinus	Peregrine Falcon	bird	Stoke-on-Trent Ci	Milton	SJ9051	30/11/2008	WFix1 N1368
Falco peregrinus	Peregrine Falcon	bird	Brown Edge CP	Brown Edge	SJ9053	13/10/2008	WFix1 N649
Falco peregrinus	Peregrine Falcon	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	11/11/2007	BFix1 N1901
Falco subbuteo	Eurasian Hobby	bird	Stoke-on-Trent Ci	Brindley Ford	SJ8854	12/06/2005	WFix1 N2679
Falco subbuteo	Eurasian Hobby	bird	Stoke-on-Trent Ci	Norton, Stoke-on-Trent	SJ8950	23/09/2012	WFix1 N2616
Falco subbuteo	Eurasian Hobby	bird	Stoke-on-Trent Ci	Baddeley Green	SJ9051	06/06/2004	WFix1 N1368
Falco subbuteo	Eurasian Hobby	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	06/06/2011	BFix1 N1901
Falco subbuteo	Eurasian Hobby	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	17/07/2013	BFix1 N1901
Falco subbuteo	Eurasian Hobby	bird	Endon and Stanle	Endon	SJ9252	21/09/2005	BFix1 N1901
Fringilla montifringilla	Brambling	bird	Brown Edge CP	Brown Edge	SJ9053	08/02/2003	WFix4 N649
Fringilla montifringilla	Brambling	bird	Stoke-on-Trent Ci	Baddeley Edge	SJ9150	02/11/2008	BFix2 N2517
Fringilla montifringilla	Brambling	bird	Bagnall CP	Baddeley Edge	SJ9150	20/03/2010	BFix2 N2517
Fringilla montifringilla	Brambling	bird	Bagnall CP	Baddeley Edge	SJ9150	2003	WFix6 N2517
Fringilla montifringilla	Brambling	bird	Endon and Stanle	Endon	SJ9252	30/03/2006	BFix1 N1901
Fringilla montifringilla	Brambling	bird	Endon and Stanle	Endon	SJ9253	22/02/2003	WFix1 N1972
Fringilla montifringilla	Brambling	bird	Endon and Stanle	Endon	SJ9253	24/11/2012	WFix1 N1972
Jynx torquilla	Eurasian Wryneck	bird	Brown Edge CP	Brown Edge	SJ9053	04/05/2011	BFieldN649
Jynx torquilla	Eurasian Wryneck	bird	Marshes Hill		SJ9054	04/05/2011	BFix1 N1641
Loxia curvirostra	Common Crossbill	bird	Stoke-on-Trent Ci	Milton	SJ9051	23/10/2005	WFix1 N1368
Loxia curvirostra	Common Crossbill	bird	Stoke-on-Trent Ci	Light Oaks - garden	SJ9150	08/06/2008	BFix1 N2517
Milvus milvus	Red Kite	bird	Stoke-on-Trent Ci	Norton-in-the-Moors	SJ8951	16/03/2015	WFix1 N1766
Milvus milvus	Red Kite	bird	Stoke-on-Trent Ci	Baddeley Green	SJ9051	05/06/2012	WFix1 N1368
Milvus milvus	Red Kite	bird	Brown Edge CP	Brown Edge	SJ9054	23/08/2013	WFix1 N1641
Milvus milvus	Red Kite	bird	Endon and Stanle	Endon	SJ9252	27/05/2013	WFix1 N1901
Milvus milvus	Red Kite	bird	Endon and Stanle	Endon	SJ9253	27/05/2013	BFix1 N1972
Numenius phaeopus	Whimbrel	bird	Stoke-on-Trent Ci	Milton	SJ9051	28/08/2007	WFix1 N1368
Pandion haliaetus	Osprey	bird	Stoke-on-Trent Ci	Chatterley Whitfield	SJ8853	17/08/2007	WFix1 N2215
Pluvialis apricaria	European Golden Plover	bird	Bagnall CP	Baddeley Edge	SJ9150	24/09/2005	WFix2 N2517
Pluvialis apricaria	European Golden Plover	bird	SJ95	Light Oaks-golf course-Baddeley Edge	SJ9150	24/09/2005	BFix2 N2517
Tringa ochropus	Green Sandpiper	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	02/12/2010	WFix1 N2521
Tringa ochropus	Green Sandpiper	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	22/11/2014	WFix1 N2521
Tringa ochropus	Green Sandpiper	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	24/11/2014	WFix1 N2521
Tringa ochropus	Green Sandpiper	bird	Whitfield Valley LC	Chatterley Whitfield	SJ8853	20/11/2014	WFix1 N2215
Turdus iliacus	Redwing	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	01/12/2008	BFix2N2521
Turdus iliacus	Redwing	bird	Bradeley (1km sq)		SJ8851	06/12/1983	SFieldfd2521
Turdus iliacus	Redwing	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	16/10/2014	WFix1N2521
Turdus iliacus	Redwing	bird	Chatterley (1km sq)		SJ8853	17/01/1984	SFieldfd2215
Turdus iliacus	Redwing	bird	Norton-in-the-Moors (1km sq)		SJ8951	24/02/1984	SFieldfd1766
Turdus iliacus	Redwing	bird	Brown Edge CP	Dallows Wood & Canal Feeder	SJ8954	18/03/2006	BFix7N1985
Turdus iliacus	Redwing	bird	Milton (1km sq)		SJ9050	19/03/1984	SFieldfd2365
Turdus iliacus	Redwing	bird	Stoke-on-Trent Ci	Baddeley Green	SJ9051	17/12/2009	BFix1 N1368
Turdus iliacus	Redwing	bird	Stoke-on-Trent Ci	Milton	SJ9051	27/09/2007	WFix2 N1368
Turdus iliacus	Redwing	bird	Norton Green Hall	Norton Green	SJ9052	11/02/1991	SFieldN384
Turdus iliacus	Redwing	bird	Stoke-on-Trent Ci	Stockton Brook	SJ9052	16/04/1990	WFix1 N384
Turdus iliacus	Redwing	bird	Brown Edge CP	Brown Edge	SJ9053	28/12/2009	BFix3:N649
Turdus iliacus	Redwing	bird	Stoke-on-Trent Ci	Light Oaks - garden	SJ9150	01/01/2008	BFieldN2517
Turdus iliacus	Redwing	bird	Bagnall CP	Baddeley Edge	SJ9150	05/10/2005	WFix5 N2517
Turdus iliacus	Redwing	bird	SJ95	Light Oaks-golf course-Baddeley Edge	SJ9150	05/10/2005	BFix5 N2517
Turdus iliacus	Redwing	bird	Bagnall CP	Baddeley Edge	SJ9150	05/11/2005	WFix1N2517
Turdus iliacus	Redwing	bird	SJ95	Light Oaks-Bagnall Wood-Woodhead	SJ9150	05/11/2005	BFix1N2517
Turdus iliacus	Redwing	bird	Bagnall CP	Baddeley Edge	SJ9150	15/03/2005	WFix1 N2517
Turdus iliacus	Redwing	bird	SJ95	Light Oaks-golf course-Baddeley Edge	SJ9150	15/03/2005	BFix1 N2517
Turdus iliacus	Redwing	bird	Bagnall CP	Baddeley Edge	SJ9150	23/03/2005	WFix2 N2517
Turdus iliacus	Redwing	bird	SJ95	Light Oaks-Bagnall Wood-Woodhead	SJ9150	23/03/2005	BFix2 N2517
Turdus iliacus	Redwing	bird	Bagnall CP	Baddeley Edge	SJ9150	27/11/2010	BFixpN2517
Turdus iliacus	Redwing	bird	Baddeley Edge Ridge		SJ915751	05/10/1983	SFieldfd1629
Turdus iliacus	Redwing	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	11/11/2007	BFix5N1901
Turdus iliacus	Redwing	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	14/11/2004	BFix1N1901
Turdus iliacus	Redwing	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	19/11/2004	BFix2N1901
Turdus iliacus	Redwing	bird	Endon and Stanle	Endon	SJ9253	20/11/2014	BFixcN1972
Turdus iliacus	Redwing	bird	Endon and Stanle	Endon	SJ9253	25/11/2014	BFix2 N1972
Turdus pilaris	Fieldfare	bird	Bradeley (1km sq)		SJ8851	06/12/1983	SFieldfd2521
Turdus pilaris	Fieldfare	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	10/11/2014	WFix3N2521
Turdus pilaris	Fieldfare	bird	Ford Green Reed	Ford Green Nature Reserve	SJ8851	18/11/2014	WFix1 N2521
Turdus pilaris	Fieldfare	bird	Chatterley (1km sq)		SJ8853	17/01/1984	SFieldfd2215
Turdus pilaris	Fieldfare	bird	Norton-in-the-Moors (1km sq)		SJ8951	24/02/1984	SFieldfd1766
Turdus pilaris	Fieldfare	bird	Stonehouse Drumble		SJ902545	1970 - 1985	SFieldN1728
Turdus pilaris	Fieldfare	bird	Stoke-on-Trent Ci	Baddeley Green	SJ9051	09/11/2009	BFix2 N1368
Turdus pilaris	Fieldfare	bird	Stoke-on-Trent Ci	Baddeley Green	SJ9051	28/12/2009	BFix1 N1368
Turdus pilaris	Fieldfare	bird	Stoke-on-Trent Ci	Stockton Brook	SJ9052	16/04/1990	WFix3-N384
Turdus pilaris	Fieldfare	bird	Bagnall CP	Baddeley Edge	SJ9150	05/11/2005	WFix2N2517
Turdus pilaris	Fieldfare	bird	SJ95	Light Oaks-Bagnall Wood-Woodhead	SJ9150	05/11/2005	BFix2N2517
Turdus pilaris	Fieldfare	bird	Stoke-on-Trent Ci	Stockton Brook	SJ9151	22/12/2010	BFix1 N1616
Turdus pilaris	Fieldfare	bird	Baddeley Edge Ridge		SJ915751	05/10/1983	SFieldfd1629
Turdus pilaris	Fieldfare	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	11/11/2007	BFix1 N1901
Turdus pilaris	Fieldfare	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	14/11/2004	BFix5N1901
Turdus pilaris	Fieldfare	bird	Caldon Canal (ca	Caldon Canal Endon	SJ9252	19/11/2004	BFix1N1901
Turdus pilaris	Fieldfare	bird	Endon and Stanle	Endon	SJ9253	28/10/1990	WFix1 N1972

Appendix 3 – Annual cycle of a temperate bat

January **February** **March**

Jan: Bats spend most of the winter hibernating, a state of inactivity characterised by lower body temperature, slower breathing, and lower metabolic rate. **Feb:** Bats are still hibernating. They have little fat left to live off of now. They may leave the roost on warmer nights to find food and a drink of water. **March:** Bats may begin to emerge and signs of limited activity can be seen. There are small numbers feeding as it gets warmer. In bad weather, they may become torpid.

April **May** **June**

April: Bats have mainly come out of hibernation and are hungry and active, feeding on most nights. They may be moving between several roost sites. They may become torpid (cool and inactive) again when cold. **May:** Bats are fully active and feeding. Females start forming maternity colonies and looking for suitable nursery sites, such as buildings or trees. Males will roost on their own or in small groups. **June:** Female bats usually give birth to a single pup, which they feed on their milk. Young bats are very small (less than an inch) with thin, slightly grey fur. Adult bats will catch thousands of insects each in a night.

July **August** **September**

July: Mothers continue to suckle young. Some young are growing fast and almost full-size; others are still very small. At around three weeks old, young bats are sometimes found on the ground as they learn to fly. **Aug:** At six weeks old, the young bats begin to catch insects for themselves and no longer need their mothers' milk. The summer maternity colonies begin to disperse and bats may move to mating roosts. **Sept:** Mating season begins, with males of most species using special mating calls to attract females, which can include purrs, clicks, and buzzing. Bats are also concentrating on building up fat stores for the coming months.

October **November** **December**

Oct: More mating is taking place, and building up fat reserves is becoming crucial to survive the winter season. Bats are seeking suitable hibernation sites, and beginning periods of torpor. **Nov:** Periods of torpor are lasting longer. Some begin hibernation, to save energy over the colder months, when insects are harder to find. They are using stored fat as fuel. **Dec:** Bats are hibernating. They may roost on their own or in small groups, often in cool, quiet places like disused buildings, old trees or caves, where they hopefully won't be disturbed. **(Source: Bat Conservation Trust).**

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